

Utilization Management: Key Strategies, the Role of Informatics and the MGH Approach

Jason Baron, MD



Notice of Faculty Disclosure

In accordance with ACCME guidelines, any individual in a position to influence and/or control the content of this ASCP CME activity has disclosed all relevant financial relationships within the past 12 months with commercial interests that provide products and/or services related to the content of this CME activity.

The individual below has responded that he/she has no relevant financial relationship(s) with commercial interest(s) to disclose:

Jason Baron, MD

Agenda

I. Overview: Why is test utilization management important?

II. Strategies with examples

1. Take control over CPOE
2. Leverage available data
3. Integrate clinical expertise
4. Control autopilot
5. Analyze variation
6. Get buy-in and don't act alone
7. Consider downstream effects

Agenda

I. Overview: Why is test utilization management important?

II. Strategies with examples

1. Take control over CPOE
2. Leverage available data
3. Don't ignore human factors
4. Integrate clinical expertise
5. Control autopilot
6. Analyze variation
7. Get buy-in and don't act alone
8. Consider downstream effects

Test Utilization Management

Goals

- Avoid
 - Overutilization
 - Underutilization
 - Misutilization
- Support clinically optimized and cost-effective laboratory diagnosis
- Develop patient-specific approaches to test selection

Why Avoid Overutilization?

Unnecessary Testing

1. Increases the cost of care (within lab and downstream cost)
2. Misdirects physician, nursing and laboratory resources
3. Prolongs turn around time for needed tests
4. Reduces patients' experience of care
5. Increases the risk that key findings get overlooked in masses of data
6. Leads to false positive results

Why Pathologists and Other Physicians Should Take Leadership

1. Opportunity to add economic and clinical value
2. Access to data and understanding of the key challenges
3. If we don't do this someone else will

Medscape Business of Medicine

Health Plans to Docs: Curb Costs or We'll Kick You Out

Kenneth J. Terry, MA | Disclosures

May 09, 2014

Medscape: <http://www.medscape.com/viewarticle/824858>

Agenda

I. Overview: Why is test utilization management important?

II. Strategies with examples

1. Take control over CPOE
2. Leverage available data
3. Integrate clinical expertise
4. Control autopilot
5. Analyze variation
6. Get buy-in and don't act alone
7. Consider downstream effects

The Right Tool for the Job

- There's no “one size fits all” approach to utilization management
- However, a number of “interchangeable parts” are available
- Key is to understand the tools and select the appropriate tools (strategies) for each specific situation
- Each example I will show is going to be used to highlight a single strategy, but not that almost all of them actually incorporate multiple strategies

Utilization Management is a Team Sport

- All of the initiatives described involved multiple people
- In fact, as we'll see, one key to utilization manage is to avoid acting alone
- Acknowledgements at the end

Strategies

- 1. Take control over CPOE**
- 2. Leverage available data**
- 3. Don't ignore human factors**
- 4. Integrate clinical expertise**
- 5. Control autopilot**
- 6. Analyze variation**
- 7. Get buy-in and don't act alone**
- 8. Consider downstream effects**

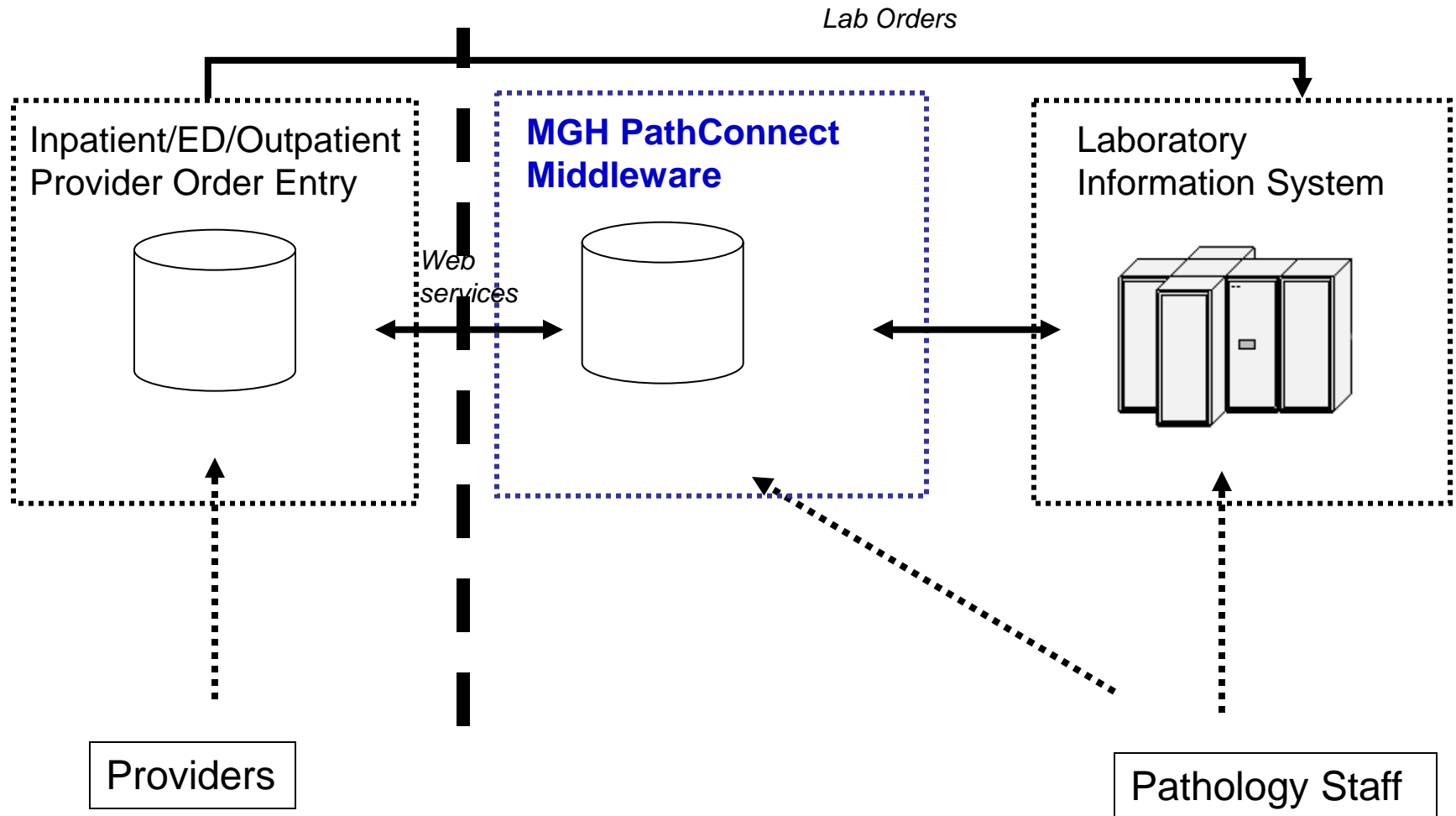
Computerized Provider Order Entry (CPOE)

- Permits electronic orders for labs, medications and other measures of care
- Rapidly expanding in use
- Provide a key leverage point to control utilization
- Can also encourage overutilization if proper care is not taken

Key: Pathology MUST be involved

MGH PathConnect Middleware

Permits Pathology to have control over Provider Order Entry screens



MGH PathConnect Provides a Portal to Edit the Clinical Content of the POE System

- Building alerts requires not technical alterations to the CPOE system

POE Test Name	CK isoenzymes (CKMB+CPK)
Test Active / Orderable	True
Test Orderable in POE	True
Test Orderable Environments	MGHED,MGHIN,MGHOP
Common Test	False,False,False
Test Population	Adult,Pedi,Neonate
Test Turn Around Time	2 hours
Test is Send Out	False
Cost	\$
Test Preferred Tube	GN3 + P3
Specimen Type	BLD
POE Test Ordering Message	UPDATED R/O MIprotocol: Trop

Improving Vitamin D Utilization with CPOE

Middleware enables rapid (minutes, to author and update test) responses to utilization issues

Search provides more than a list of possible matches →

Provides information to guide appropriate utilization

Test Lookup

Search for a Test

vit d Search 2 tests found

Name	Where	TAT	Cost
1,25 OH Vitamin D (MORE)	Send Out	4-6 days	\$\$\$
25-OH Vitamin D	In House	1-3 days	\$\$

Ordering Message

Please note that 1,25 OH vitamin D is in general NOT the test of choice for assessment of vitamin D deficiency. Please order 25-OH vitamin D if that is the intent.

Collection Instructions

Add

Tests Selected

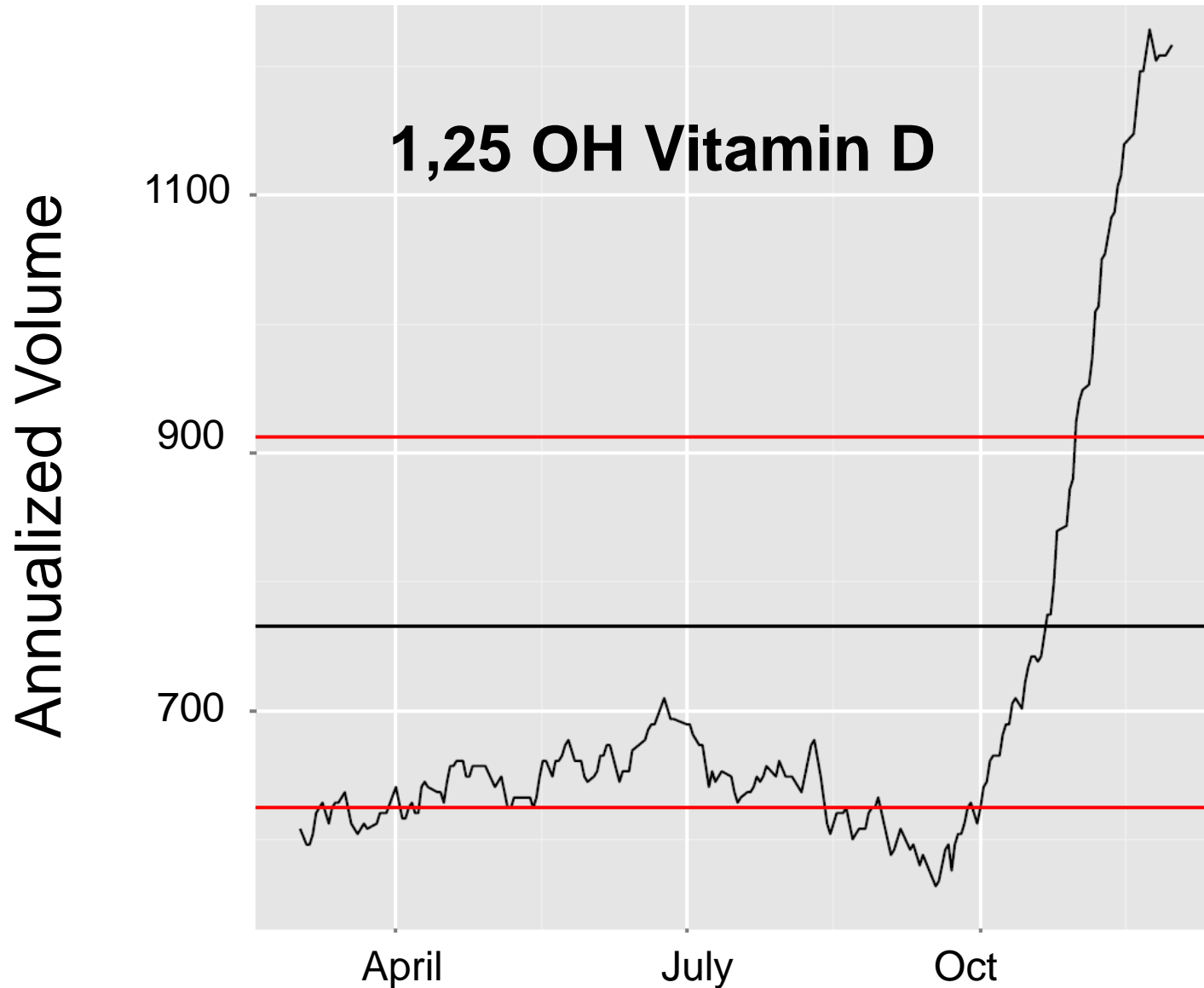
1,25 OH Vitamin D (MORE)

• Adding non-interruptive ordering message dropped 1,25 OH vitamin D orders by 70% (p < 0.001)

• Also posting costs

To select a test: double-click on the test name OR single-click and then the Add button OR use the arrow keys and then Alt-A

Vitamin D Continued... Segue to Next Strategy



Strategies

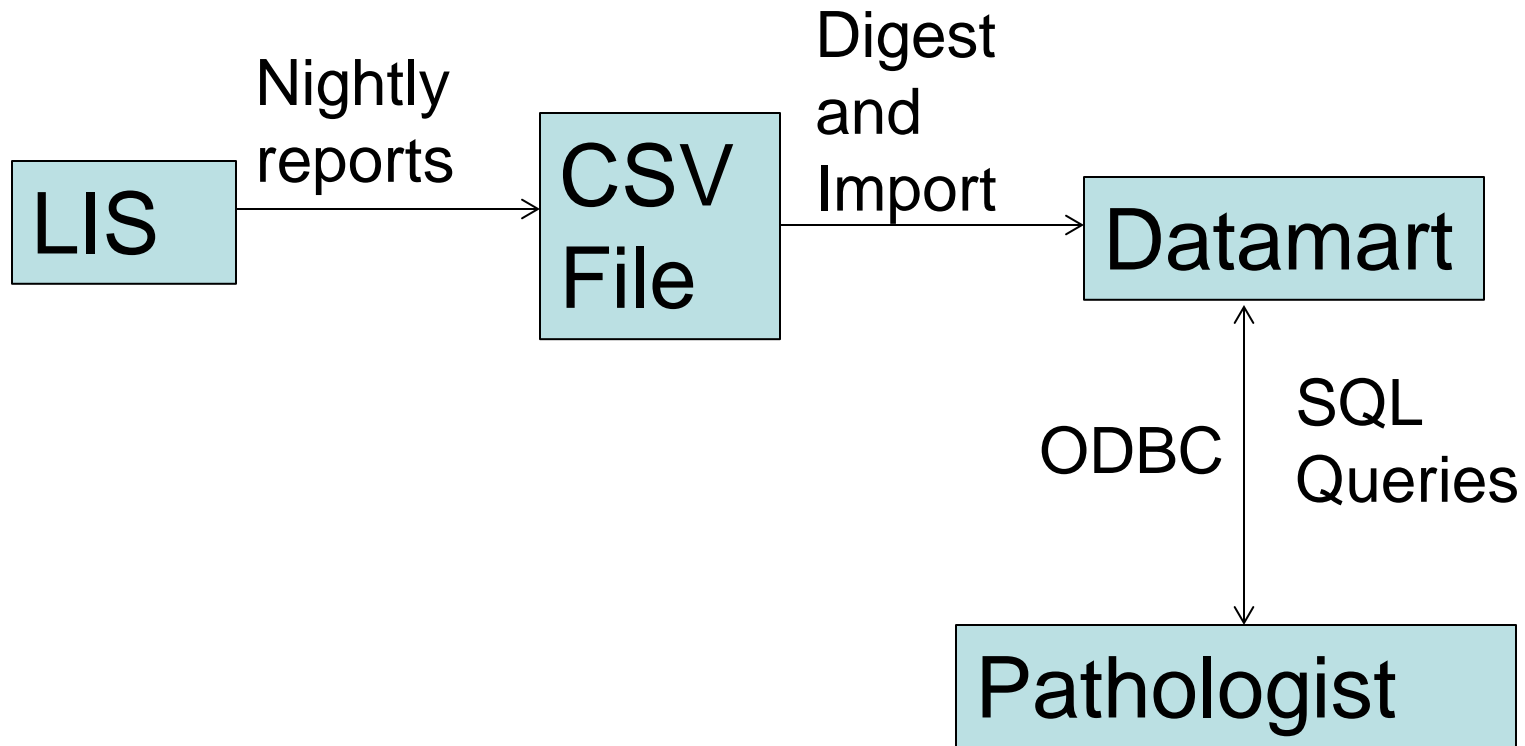
1. Take control over CPOE
2. Leverage available data
3. Integrate clinical expertise
4. Control autopilot
5. Analyze variation
6. Get buy-in and don't act alone
7. Consider downstream effects

Leverage Available Data and Always Monitor

- Clinical laboratories produce some of the highest quality data in health care (e.g. usually well structured)
- This data can be used to identify, implement and monitor utilization initiatives
- Most utilization management initiatives require data

Key: Have a readily accessible source of data and know how to use it

The Datamart



- Data readily available
- Can easily link data from multiples sources for analysis

Monitoring An Alert Message: Optimizing Cardiac Marker Use

- Creatine kinase-MB (CKMB) was classically used to diagnose myocardial infarction, but is increasingly becoming supplanted by troponin assays
- New institutional policy restricted CKMB to patients post percutaneous coronary intervention (PCI)
- CKMB policy communicated
 - Primarily via a CPOE alert
 - Also via e-mail announcements
 - Providers placing inappropriate orders received individual e-mails from lab director

Searching for CKMB first results in a non-interruptive alert

Search for a Test

CK Search 2 tests found
Double-click to select a test

Name	Where	TAT	Cost
CK isoenzymes (CKMB+CPK) ...	In House	2 hours	\$
CPK (creatine kinase)	In House	2 hours	\$

Ordering Message

UPDATED R/O MI protocol: Troponin T q8h x 3. Routine measurement of CK isoenzymes (CKMB+CPK) is no longer recommended. The use of CKMB should be restricted to the following exception: Post percutaneous coronary

Collection Instructions
Requires 3 ml Purple and 3 ml Green

Add

Remove

Modify Additional Info.

OK Cancel

To select a test: double-click on the test name OR single-click and then the Add button OR use the arrow keys and then Alt-A

Ordering Message

UPDATED R/O MI protocol: Troponin T q8h x 3. Routine measurement of CK isoenzymes (CKMB+CPK) is no longer recommended. The use of CKMB should be restricted to the following exception: Post percutaneous coronary



Proceeding past the non- interruptive alert results in an interruptive alert



Test : CK isoenzymes (CKMB+CPK)

UPDATED R/O MI protocol: Troponin T q8h x 3. Routine measurement of CK isoenzymes (CKMB+CPK) is no longer should be restricted to the following exception: Post percutaneous coronary intervention.

Additional Information :

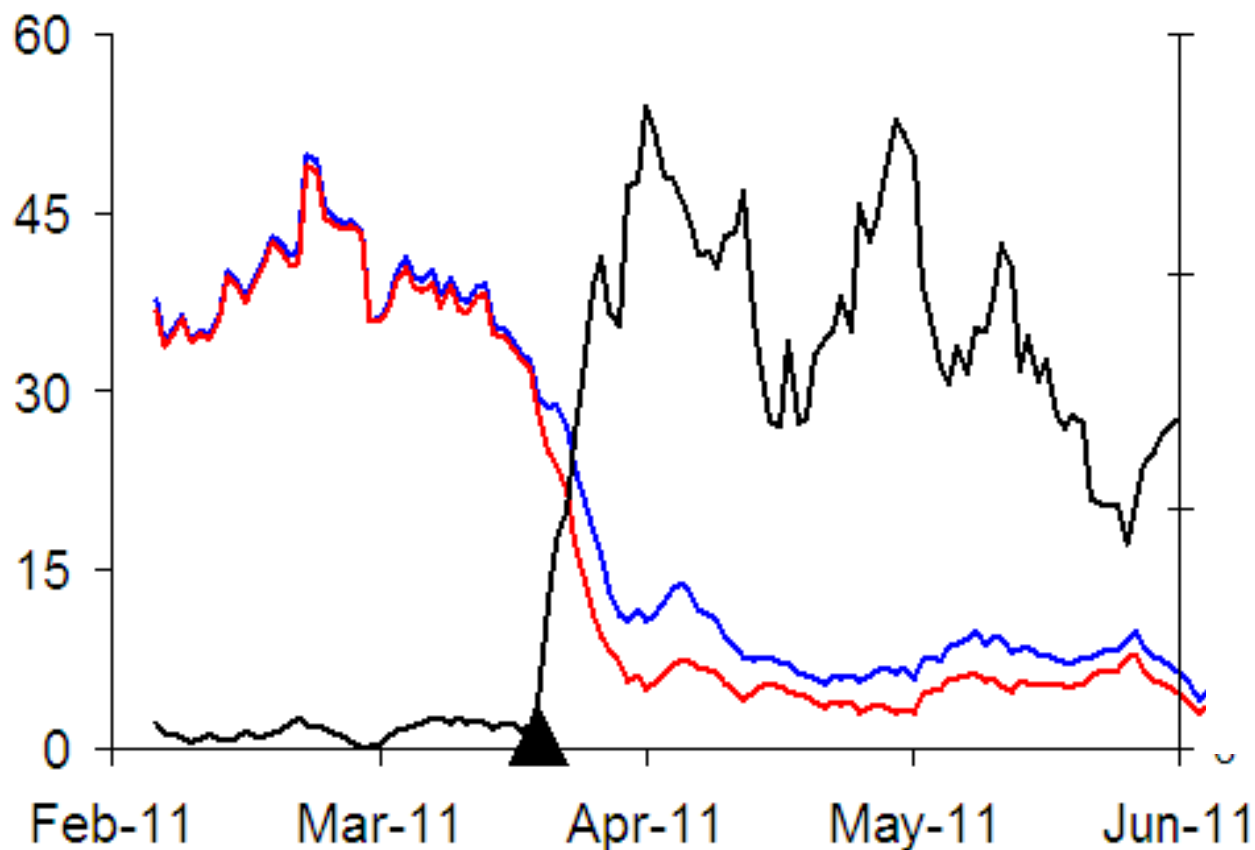
* Required fields

Indication

* Please review NOTE above and Cancel if not needed. Indication for CK-MB testing (REQUIRED):

Indications audited by laboratory director

The CKMB alert was effective in providing just-in-time advice

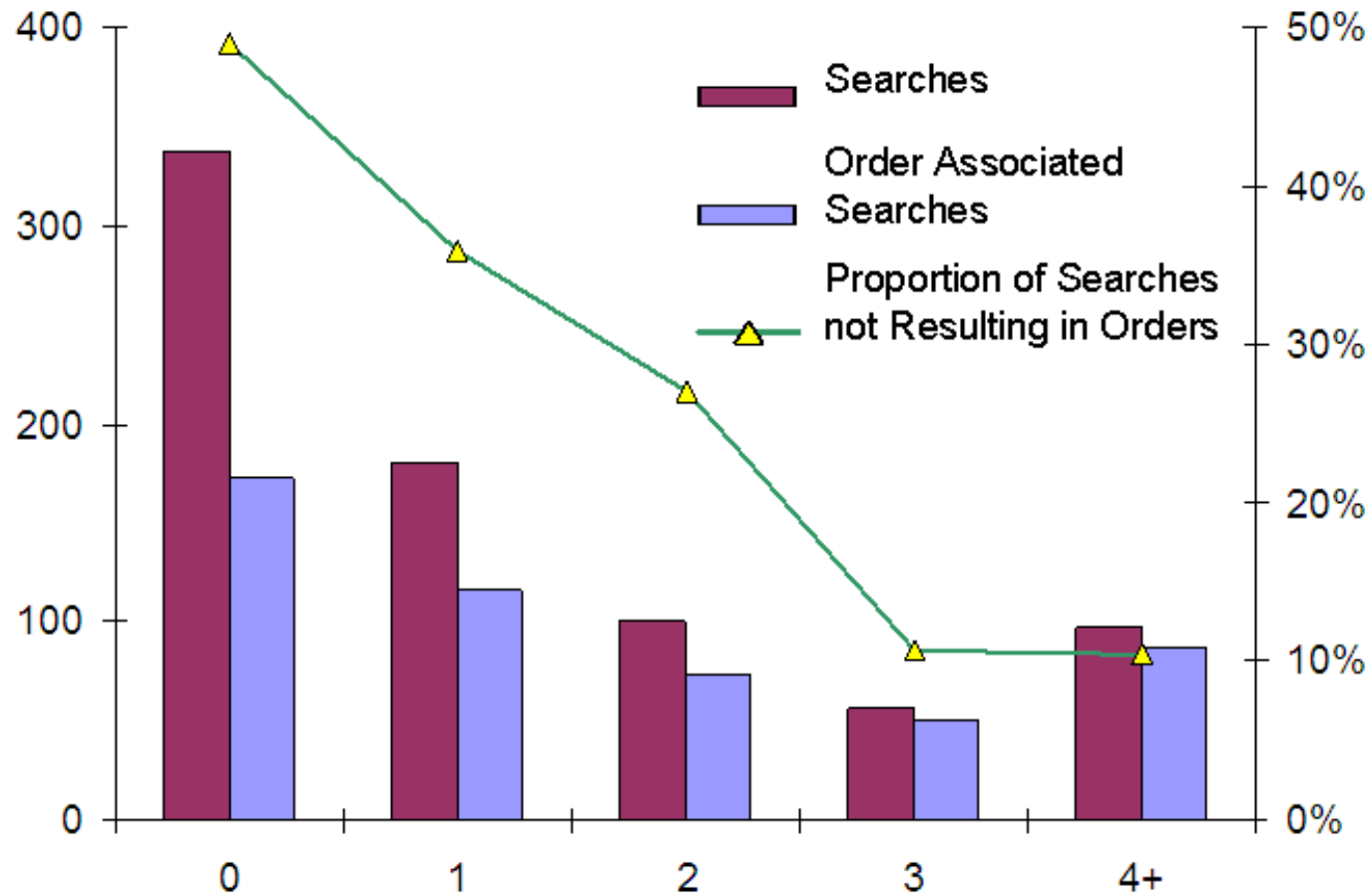


▲ Go Live — Order Associated Searches

— Searches — Proportion of Searches not Resulting in Orders

J Pathol Inform.
2012;3:11.

The CKMB alert also had longer-term educational effects



Net effect of the policy and alert on test ordering and conclusions

- CKMB orders decreased by approximately 80%
- **Cost saving to the hospital of about \$30,000 per year**
- High rate of return on time invested
- Similar alert evaluation strategies may be useful in monitoring and improving other alerts

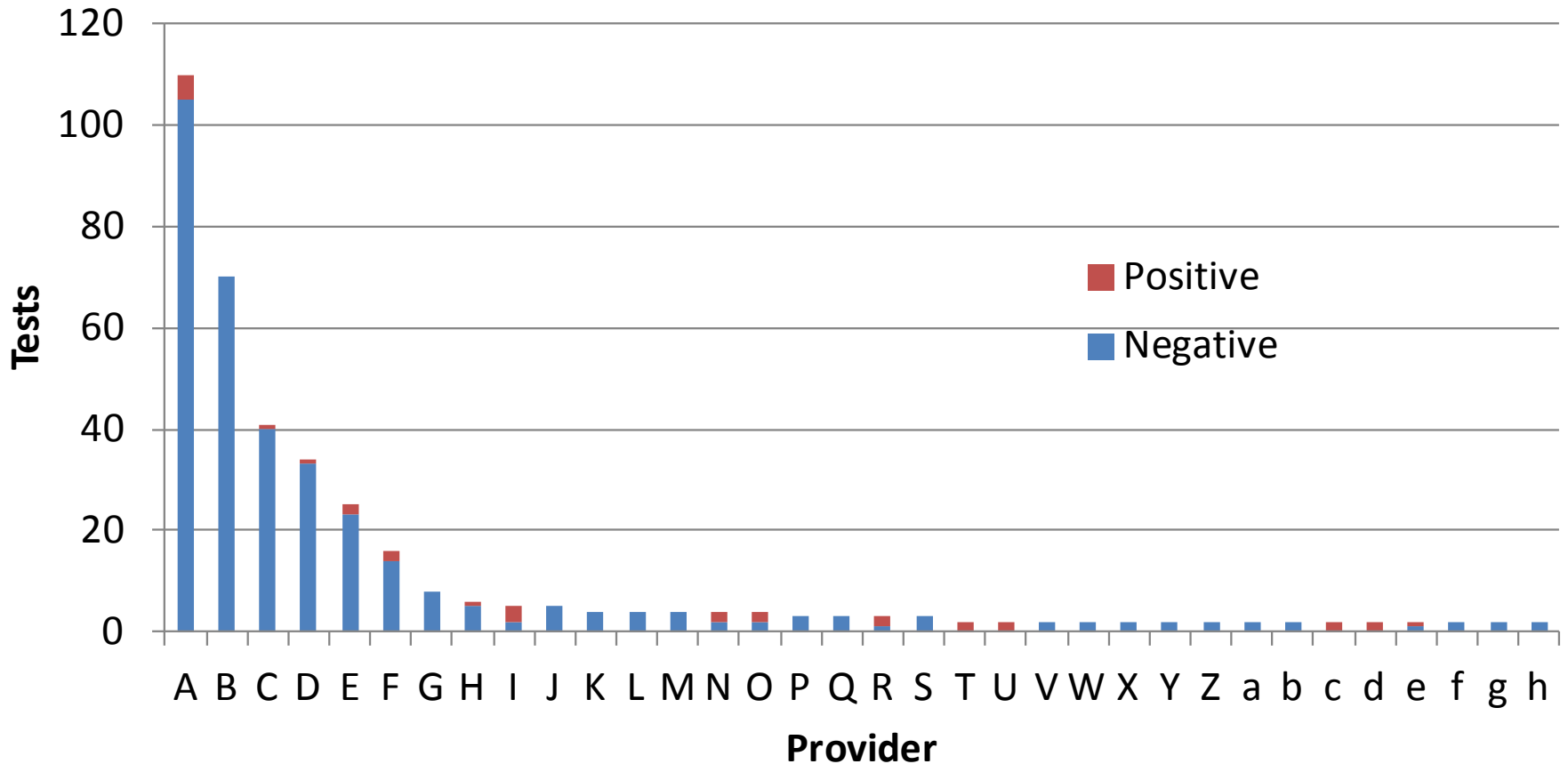
Strategies

- 1. Take control over CPOE**
- 2. Leverage available data**
- 3. Integrate clinical expertise**
- 4. Control autopilot**
- 5. Analyze variation**
- 6. Get buy-in and don't act alone**
- 7. Consider downstream effects**

Integrate Clinical Expertise

- It is impractical for us as pathologists to be experts in every test
- Must reach out to key specialists in many cases
- Also helps with “buy-in”

Babesia Serologies



- 97 Additional Physicians Ordered 1 test each (13 positives)

- Conclusion: Most ordering is by a few physicians and the yield is low**

- Solution: Propose Banning (Diagnose by Smear)**

Babesia Serology Limitations

- Yield is low. But what should we do?
- Consult an expert

Learned that serology is a limited approach

- Evaluation of acute and convalescent sera is impractical for diagnosis of acute infection
- Suffers from false positives and false negative results
- Cannot reliably distinguish active from past infection
- Not test of choice (in fact, restricted by MGH MPC)

Babesia test of choice: Thick and thin smear review

Babesia Serologies: MGH Solution-- Ban

Monthly Babesia Orders



Anaplasma/ Ehrlichia Testing

PCR	Negative	Positive
Anaplasma	424	8
Ehrlichia	397	0

Serology	#	%
All Negative	896	82.4%
Positive for Ehrlichia IgM-Only	5	0.5%
Positive for Ehrlichia IgG-Only	22	2.0%
Positive for Ehrlichia IgG and IgM-Only	1	0.1%
Positive for Anaplasma IgM-only	17	1.6%
Positive for Anaplasma IgG-only	71	6.5%
Positive for Anaplasma IgG and IgM-Only	9	0.8%
Positive for Anaplasma and Ehrlichia IgG-only	64	5.9%
Positive for Anaplasma IgG and IgM and Ehrlichia IgM	2	0.2%

Conclusion: Again, yield is low using current ordering practice

Ehrlichia and Anaplasma

1. PCR vs Serology

- Preferred test at MGH is the PCR
- PCR is more practical for diagnosis of active infection

2. What are some clues that might suggest these tests are not needed?

(data to follow)

Anaplasma is Rare in Patients with Normal AST

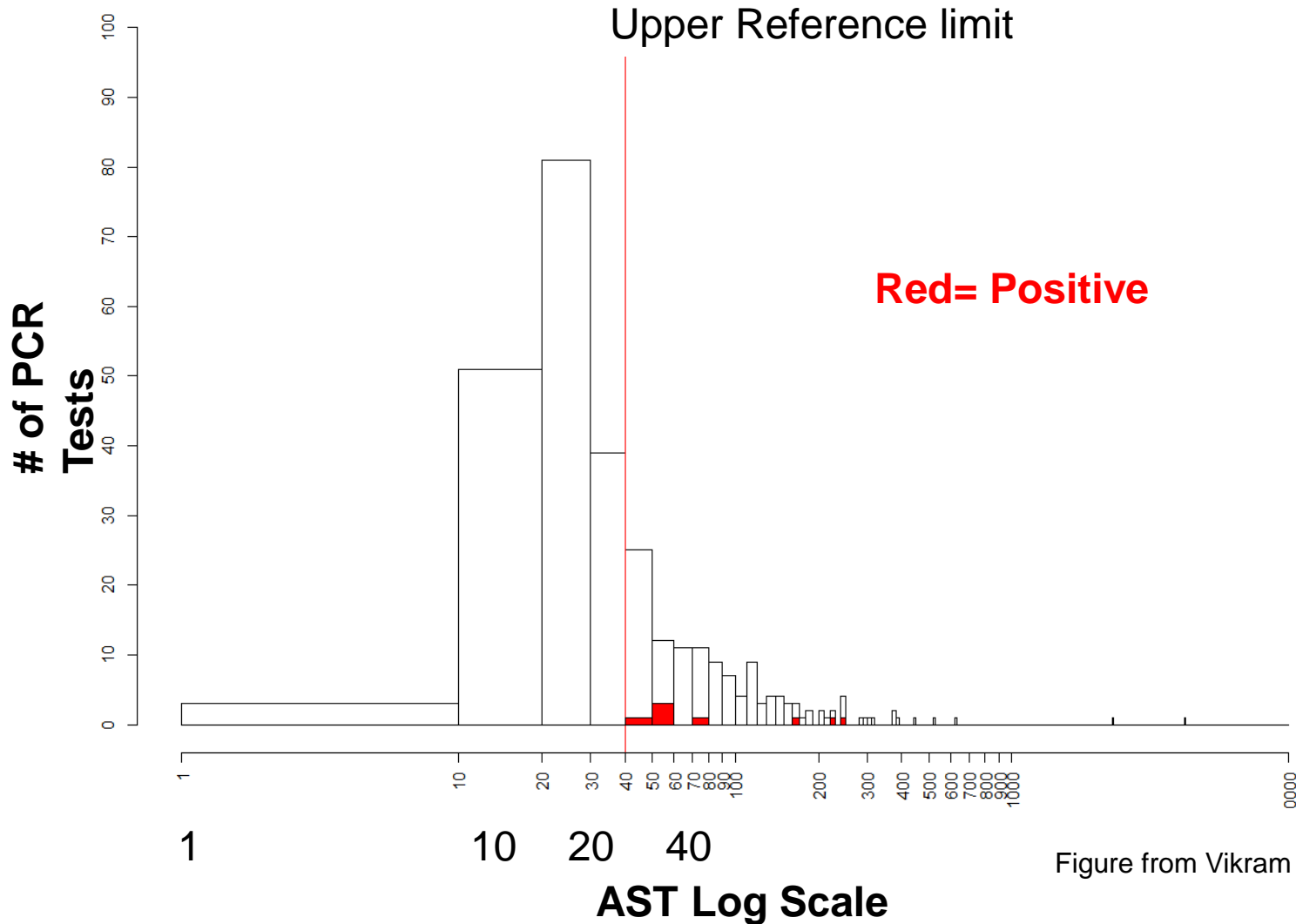
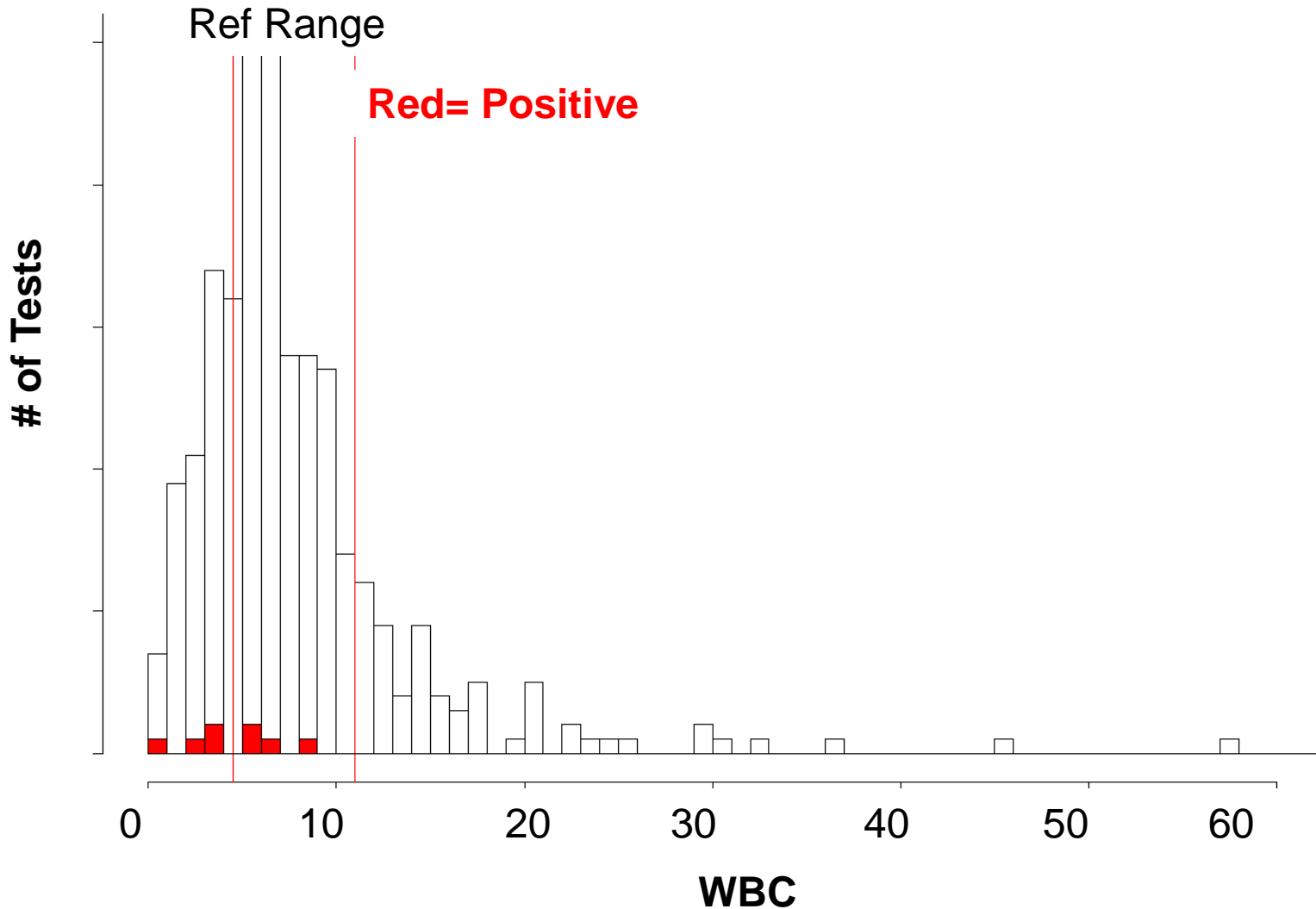


Figure from Vikram Pattanayak , MD, PhD

Anaplasma is Rare in Patients with Elevated WBCs



Ehrlichia and Anaplasma: MGH Strategy

1. Steer toward PCR

2. Gatekeep PCR

- Current implementation via an educational effort
- Gatekeeping logistics and specific policy under development

Strategies

- 1. Take control over CPOE**
- 2. Leverage available data**
- 3. Integrate clinical expertise**
- 4. Control autopilot**
- 5. Analyze variation**
- 6. Get buy-in and don't act alone**
- 7. Consider downstream effects**

Control Autopilot

- Laboratory tests should be ordered in response to specific clinical indications
- Design systems to encourage this principle and reduce use of “autopilot”
- Example: Restrict recurrent daily orders
- Also serves as an example of a cultural shift

Recurrent Daily Lab Orders

- Order entry system permits recurrent daily lab orders
- Historically, residents had used these to put laboratory testing order on “autopilot” upon patient admission
- A common source of over utilization of common tests including CBCs with Diffs and routine chemistries
- Internal medicine service agreed that in most cases, labs should be re-evaluated on a daily basis
- The medical policy committee approved restrictions on recurrent daily labs (with certain limited exceptions: chemo patients, anticoagulation monitoring, ICUs)
- However, enforcing these policies proved difficult
- Used a POE popup and e-mails to residents violating the policies

POE Changes (4/17/2012)

Laboratory Order Processing Active Pt: SQ Lab, RESERVE

Select and/or Search for Tests
Double-click to select a test

Tests Selected
CBC

Ordering message
CBC includes: HCT, HGB, WBC, RBC, MCV, MCH, MCHC, PLT.

Reasons for prolonged collections

Daily labs are NOT indicated in most cases. Please order daily labs only when clinically necessary. Daily lab draws contribute to iatrogenic anemia, increased lab turnaround time, and reduced patient satisfaction.

ALL Daily Lab draw orders will be monitored.

Total number of Daily draws

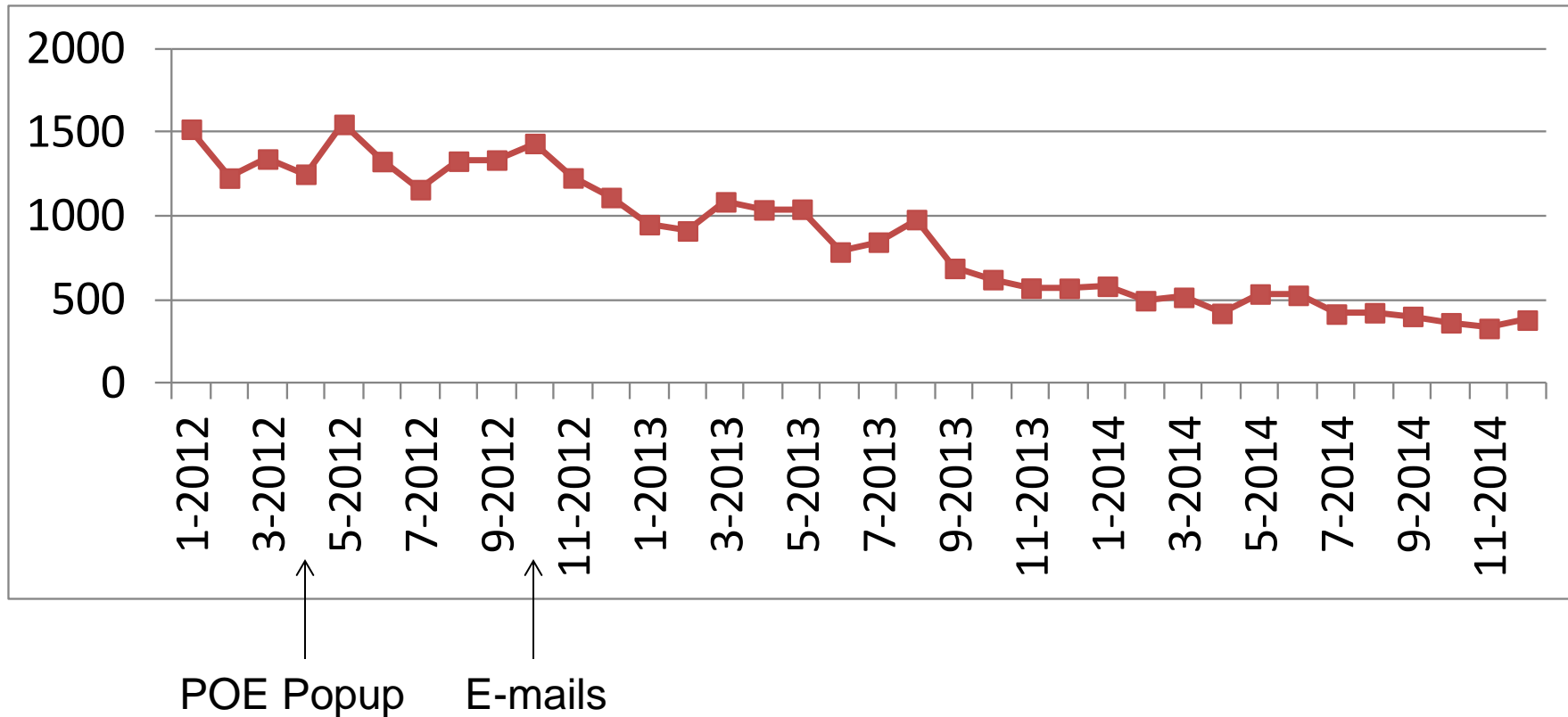
Reason(s) for daily lab tests

- Patient on coumadin.
- Patient on heparin.
- Chemotherapy regimen.
-

OK Cancel

Search Help OK Cancel

Daily Orders Per Month Without an Apparent Approved Indication



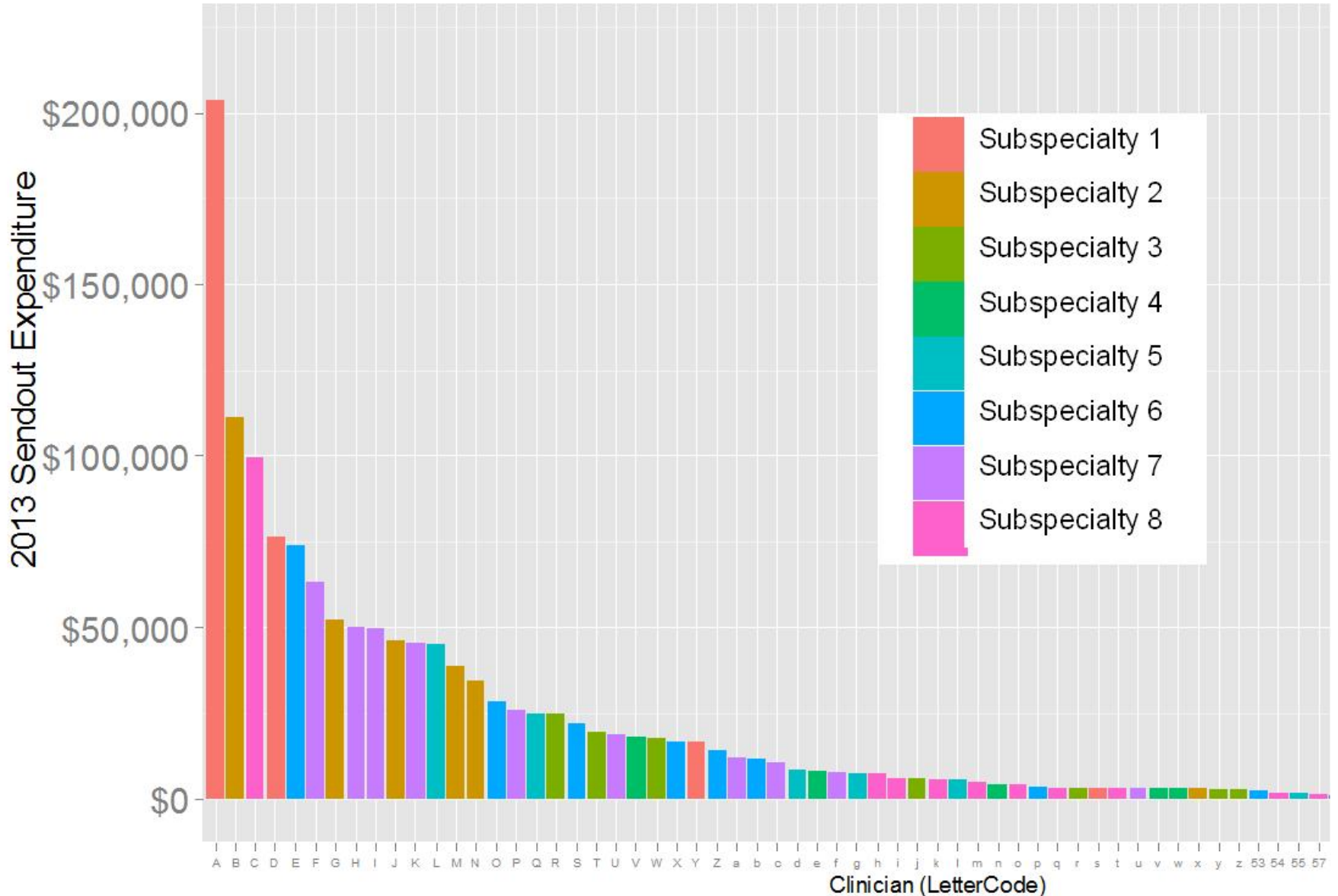
Strategies

- 1. Take control over CPOE**
- 2. Leverage available data**
- 3. Integrate clinical expertise**
- 4. Control autopilot**
- 5. Analyze variation**
- 6. Get buy-in and don't act alone**
- 7. Consider downstream effects**

Variation

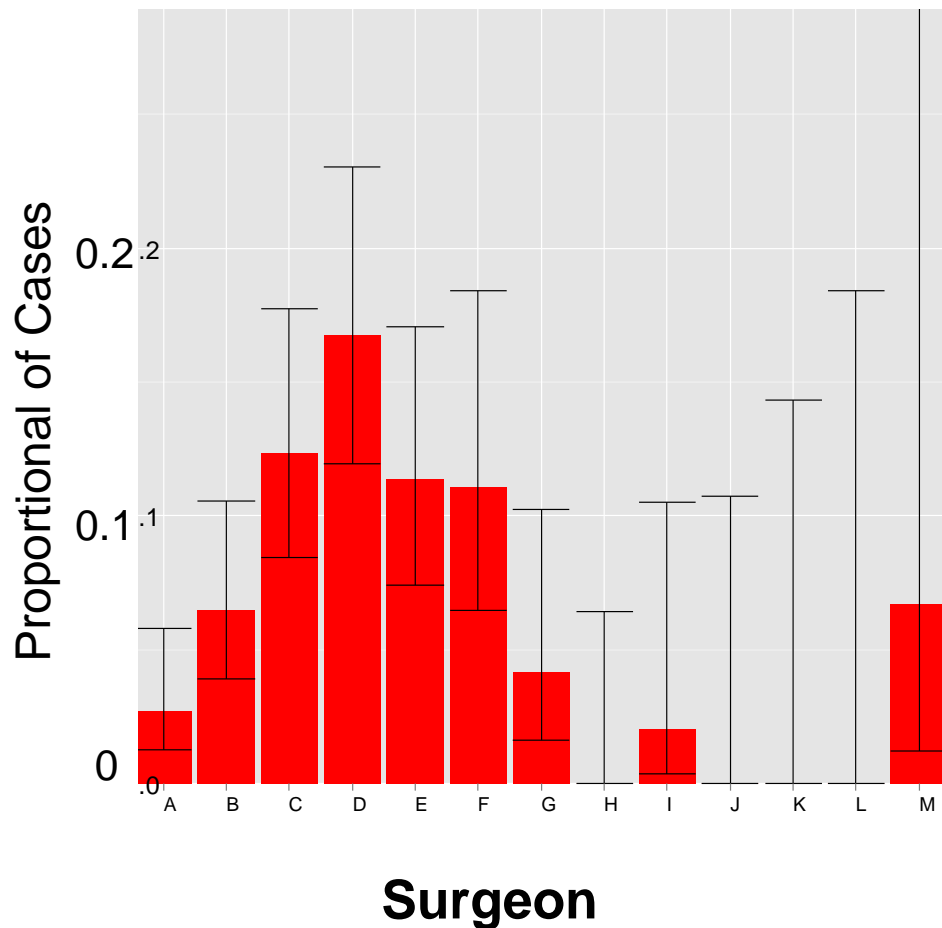
- Test ordering patterns can be compared between physicians and leveraged as a utilization management tool
- Clinicians may pay more attention to ordering when they know they are being monitored (“Hawthorne Effect”)
- Clinicians identified as outliers may adjust test ordering practice to better mimic colleagues
- Variation can be used to help target utilization initiatives (e.g. ask clinical divisions with wide variation to develop internal ordering guidelines)
- Important to qualitatively or quantitatively account for factors that appropriately impact utilization (e.g. subspecialty or patient mix)

Inter-Specialist Variation in Sendout Costs

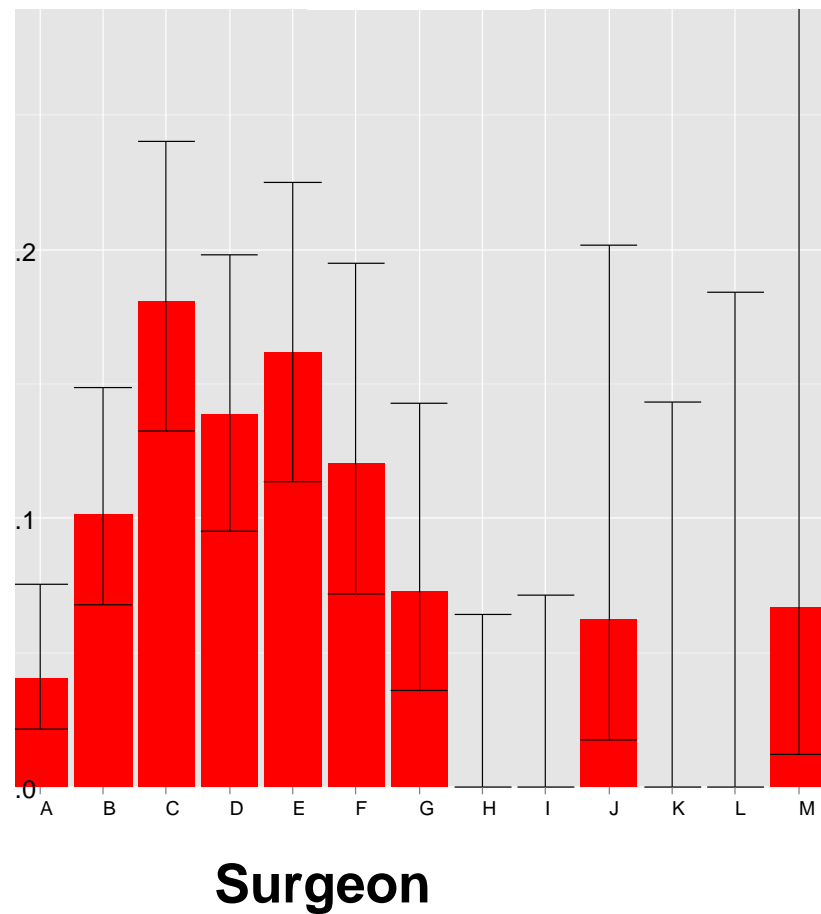


Pre-op Labs Variation Analysis

PT/ INR



BMP



Strategies

- 1. Take control over CPOE**
- 2. Leverage available data**
- 3. Integrate clinical expertise**
- 4. Control autopilot**
- 5. Analyze variation**
- 6. Get buy-in and don't act alone**
- 7. Consider downstream effects**

Get Buy-in

“Friends may come and go but enemies accumulate”

-- Kent Lewandrowski, MD

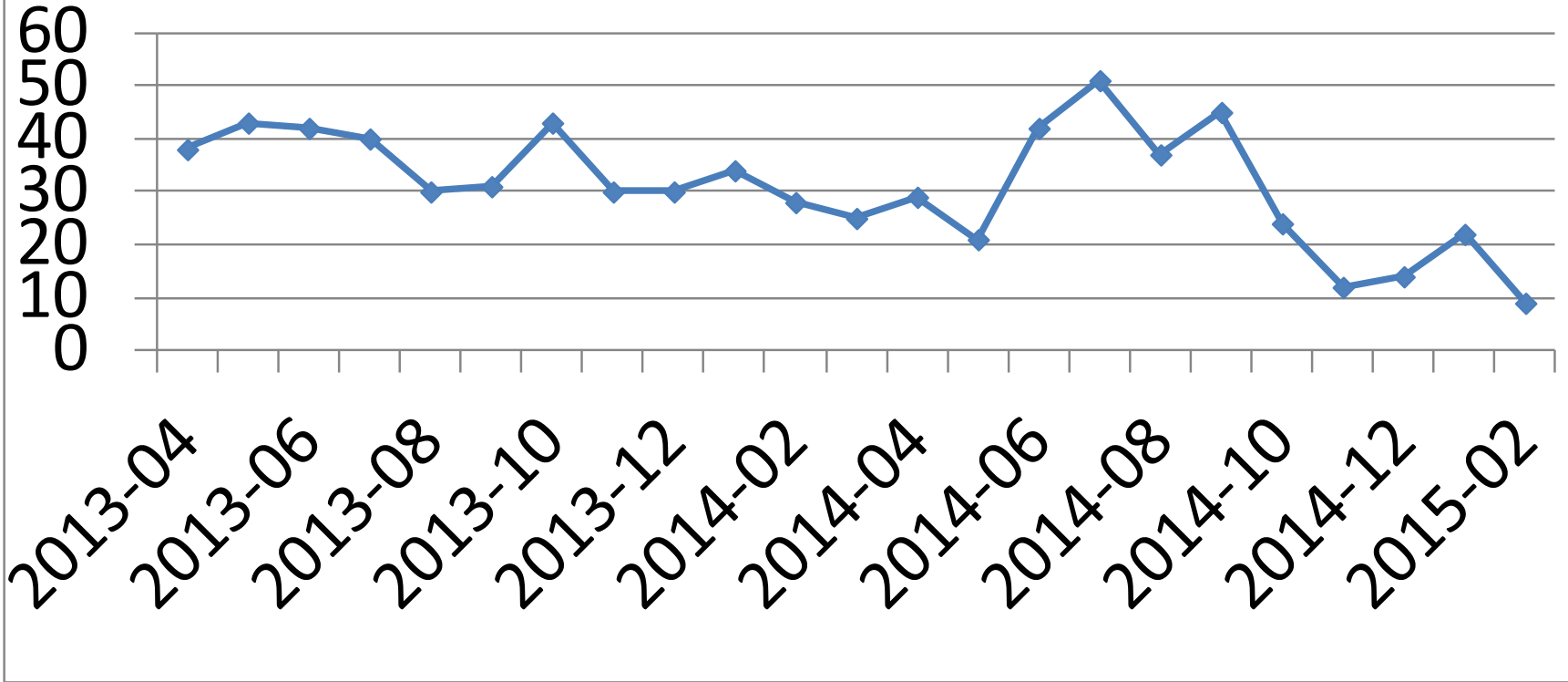
- Always discuss initiatives with key clinicians
- Much more likely to succeed with clinician buy-in → particularly in the long run

HHV-6

- Wide variation in use among bone marrow transplant docs
- Transplant ID felt that the indications were quite limited
- Unneeded testing leads to downstream costs (e.g. ID consults)
- Kent Lewandrowski contacted the head of BMT to discuss
- BMT agreed to use the test only in protocol patients and other limited indications

HHV-6 Trend

Monthly HHV6 Volumes



Strategies

- 1. Take control over CPOE**
- 2. Leverage available data**
- 3. Integrate clinical expertise**
- 4. Control autopilot**
- 5. Analyze variation**
- 6. Get buy-in and don't act alone**
- 7. Consider downstream effects**

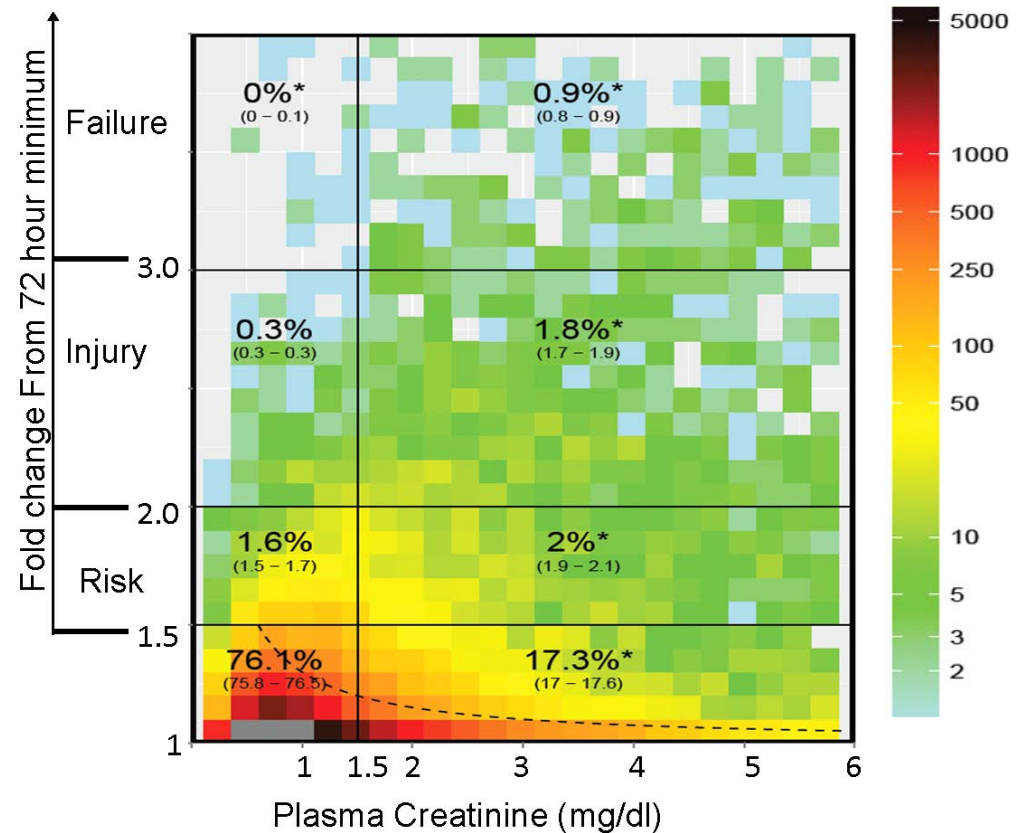
Consider Downstream Effects

- Laboratory accounts for ~4% of costs but laboratory data is incorporated into ~70% of clinical decisions
- Much of the big costs savings may be leveraging laboratory utilization to control downstream costs
- E.g.
 - HHV6 or fungal antigens and ID consults
 - Coags and blood product use
 - Overlooked diagnoses (e.g. AKI)

Example, Acute Kidney Injury Flagging



Acute Kidney Injury (AKI) and Creatinine Reporting Challenges

- AKI can be diagnosed based on trends in creatinine
- However, in standard reporting creatinine values are only flagged if outside of the reference range
- Values indicative of AKI often remain within the reference range
- Clinicians often quickly scan lab values for flagged result outside of reference range



Acute Kidney Injury Detection

	T=70	T=46 hrs	T=0
CRE	1.49(T)	1.35	1.11
EGFR	see detail	40(T)	50(T)

 Plasma Creatinine	<p style="text-align: center;">1.49</p> <p>INCREASED</p>
 eGFR	<p>Patient creatinine values are increasing. The calculated GFR (shown below) may thus overestimate the true GFR and should not be used to guide medication dosing. Please also multiply the result shown below by 1.21 if the patient is African-American.</p> <p>Result = 35 mL/min/1.73m²</p>

Overall Guiding Principles

- Strategies presented individually for clarity sake but most initiatives rely on at least several of these strategies
- A few reminders:
 - Leverage data
 - Get “buy-in”
 - Utilization management is a long-term effort → not all initiatives are going to be glaring successes in the short run
- Utilization management provides a key opportunity for pathologists and pathology informaticists

Acknowledgements

Multiple Initiatives/ Slides

- Kent Lewandrowski
 - Anand Dighe
- John Gilbertson
- Eric Rosenberg

Specific Initiatives (Not Listed Above)

Datamart/ Middleware

- JiYeon Kim
- Genti Strazimiri
- Bob Clark
- Sidi Belkziz
- Irina Kamis
- Balaji Singh

Acute Kidney Injury Flag

- Xingxing Cheng
- Hasan Bazari
- Ishir Bhan
- Rosemary Jaromin
- Chris Lofgren

Variation Analysis

- Michael Hidrue
- Jeffrey Weilburg
- Chris Sstrom
- Edward Lahey

Tick Borne Illness

- Vikram
Pattanayak

Thank You



MASSACHUSETTS
GENERAL HOSPITAL

PATHOLOGY

*Advancing Diagnosis
and Discovery*

A logo featuring a blue DNA double helix and a grey microscope, symbolizing modern medical research and discovery.