Laboratory Stewardship:

Taking the First Steps to Downstream Savings

Andrew Fletcher MD

ARUP® LABORATORIES

Background

13 Billion test performed

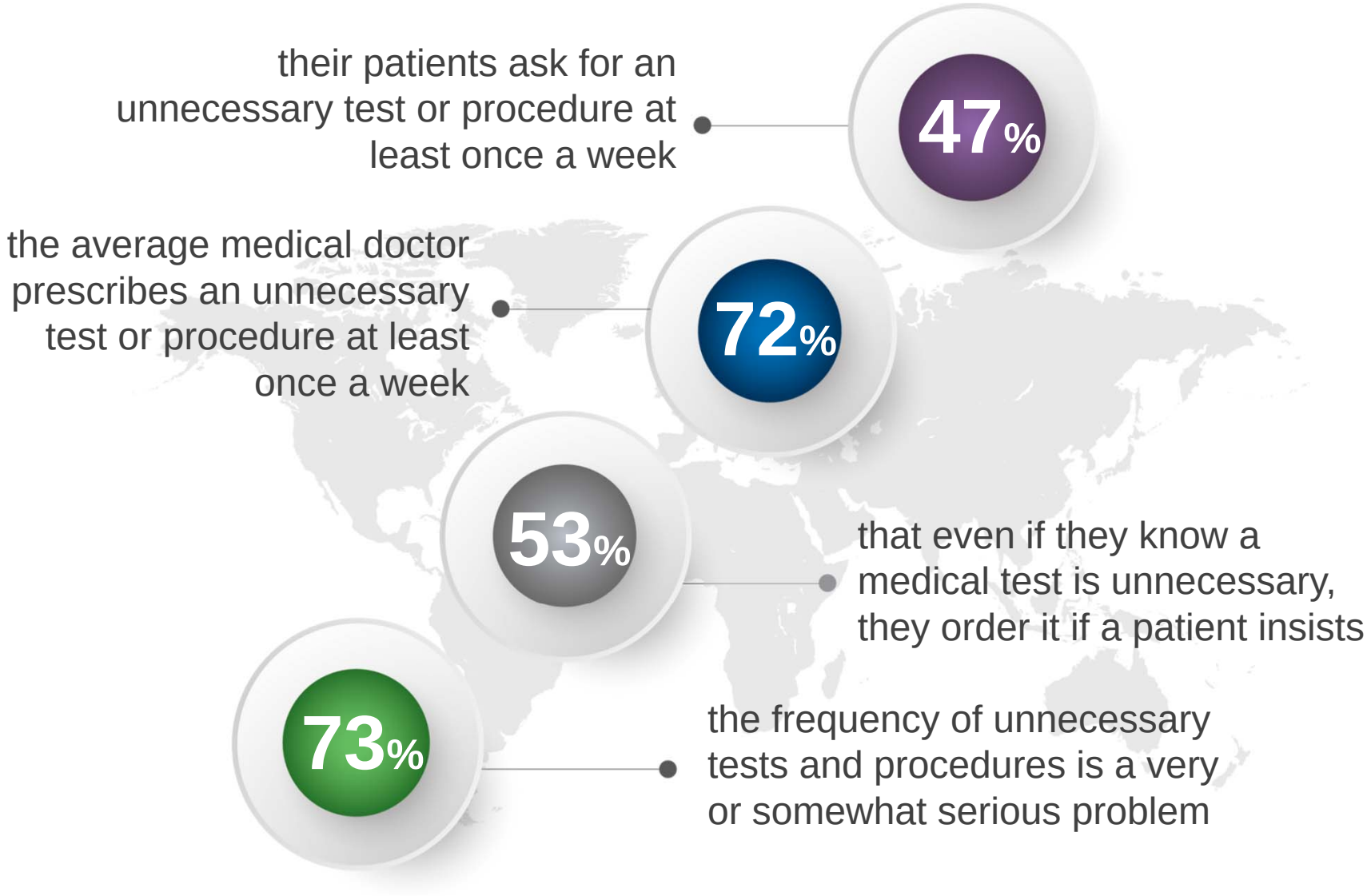
70% decisions based

10-30% unnecessary

Background

3 most significant causes of patient harm

- Ordering the **wrong** test
- Failing to **retrieve** a test result
- **Misinterpreting** a test result


their patients ask for an unnecessary test or procedure at least once a week
47%
the average medical doctor prescribes an unnecessary test or procedure at least once a week
72%
53%
that even if they know a medical test is unnecessary, they order it if a patient insists
73%
the frequency of unnecessary tests and procedures is a very or somewhat serious problem

Trends in Healthcare

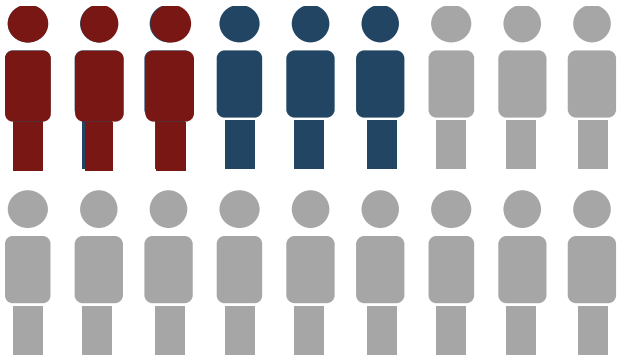
Creating Successful Laboratory Stewardship

1/3

of labs have a stewardship program

1/2

of those labs have a productive and progressing committee



Success Factors

Data Analysis

Formal Governance

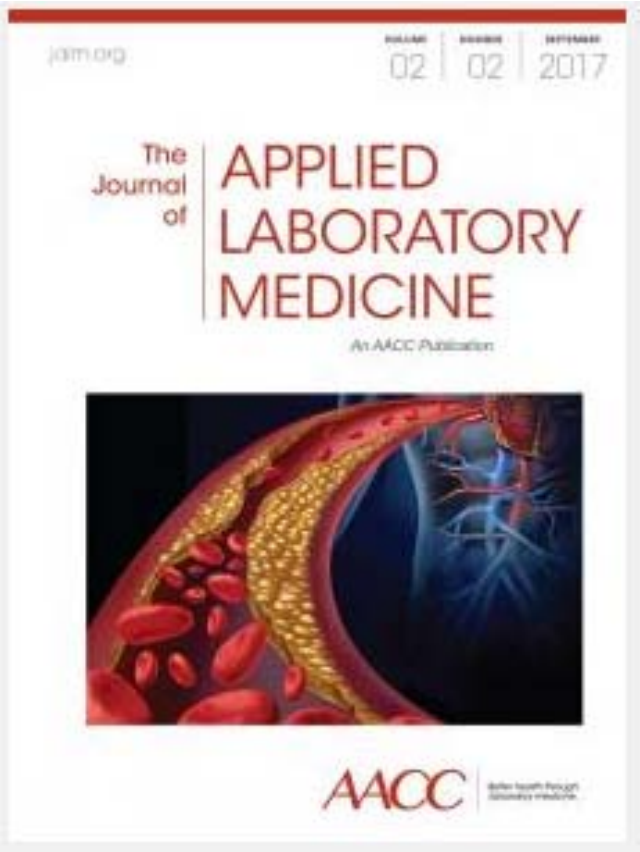
Evidence-Based Recommendations

IT Engagement and Support

Project Management

Measurement and Reporting

NCLS Publication



SPECIAL REPORT

Transforming Laboratory Utilization Review into Laboratory Stewardship: Guidelines by the PLUGS National Committee for Laboratory Stewardship

Jane A. Dickerson,[1,2]* Andrew H. Fletcher,[3] Gary Procop,[4] David F. Keren,[5] Ila R. Singh,[6] Joaquin J. Garcia,[7] Robert B. Carpenter,[3] Joe Miles,[3] Brian Jackson,[3] and Michael L. Astion[1,2]

Appropriate utilization of clinical laboratory services is important for patient care and requires institutional stewardship. Clinical laboratory stewardship programs are dedicated to improving the ordering, retrieval, and interpretation of appropriate laboratory tests. In addition, these programs focus on developing, maintaining, and improving systems to provide proper financial coverage for medically necessary testing. Overall, clinical laboratory stewardship programs help clinicians improve the quality of patient care while reducing costs to patients, hospitals, and health systems. This document, which was created by a new multiinstitutional committee interested in promoting and formalizing laboratory stewardship, summarizes core elements of successful hospital-based clinical laboratory stewardship programs. The core elements will also be helpful for independent commercial clinical laboratories.

Pathology and laboratory medicine have transformed the practice of medicine by providing tests and services for diagnosis, treatment, monitoring, and prevention of disease and driving advances in all fields of medicine. Laboratory testing is the single highest-volume medical activity with an estimated 13 billion tests performed in the US each year (*1*). In addition, about 70% of downstream medical decisions are based on pathology and laboratory medicine results (*2*).

The 3 most significant causes of patient harm related to laboratory services are ordering the wrong test, failing to retrieve a test, and misinterpreting a test result (*3*). A number of studies, as well as review of insurance claims, reveal that 10%–30% of laboratory tests performed in the US are either unnecessary or inappropriate (*4*). About 30% of genetic test orders are inappropriate (*5*), and about 5% of genetic test orders are frank medical errors (*6*). About 7% of test results are never retrieved or retrieval is significantly delayed (*7*). Like all medical interventions, inappropriate laboratory test ordering and interpretation have serious effects, including delayed

[1]Department of Laboratories, Seattle Children's Hospital, Seattle, WA; [2]Department of Laboratory Medicine, University of Washington, Seattle, WA; [3]ARUP Laboratories, Salt Lake City, UT; [4]Department of Pathology, Cleveland Clinic, Cleveland, OH; [5]Department of Pathology, University of Michigan, Ann Arbor, MI; [6]Department of Pathology, Texas Children's Hospital, Houston, TX; [7]Department of Laboratories, Mayo Clinic, Rochester, MN.
***Address correspondence to this author at:** Seattle Children's Hospital, 4800 Sand Point Way NE, M/S OC.8.720, Seattle, WA 98105.
Fax 206-987-3840; e-mail jane.dickerson@seattlechildrens.org.
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[8] **Nonstandard abbreviations:** UM, utilization management; PLUGS, Pediatric Laboratory Utilization Guidance Services; CPOE, computerized provider order entry.

Where to Start?

Three Initial areas of Focus

Test Consolidation

How many reference labs do you use?

Reference test formulary

Creation & Implementation

In-House Testing

Daily recurring labs

Inappropriate test intervals

Test Consolidation

How many reference laboratories do you use?

1. Is there a primary Vendor?
2. Why are tests sometimes not consolidated?

-Physician Request
-Patient Request
-Insurance requirement
-Easier process for lab staff

Free Phenytoin at Lab X	**$106**
Free Phenytoin at Primary Lab vendor	**$13**

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Test Formulary

Review	Eliminate	Review
		
all send out testing performed in 1 year	test listing in menu if ordered <4 times in 1 year	remaining test on menu to see if reasonable

POE Optimization

Vitamin D
- 1,25-Dihydroxy vitamin D
- **25-Hydroxy vitamin D**

Folate
- Folate (RBC)
- **Folate (serum)**

Flu
- Flu PCR
- Flu respiratory viral panel
- **Flu screen**

Gonorrhea
- Gonorrhea culture
- **Gonorrhea DNA probe**

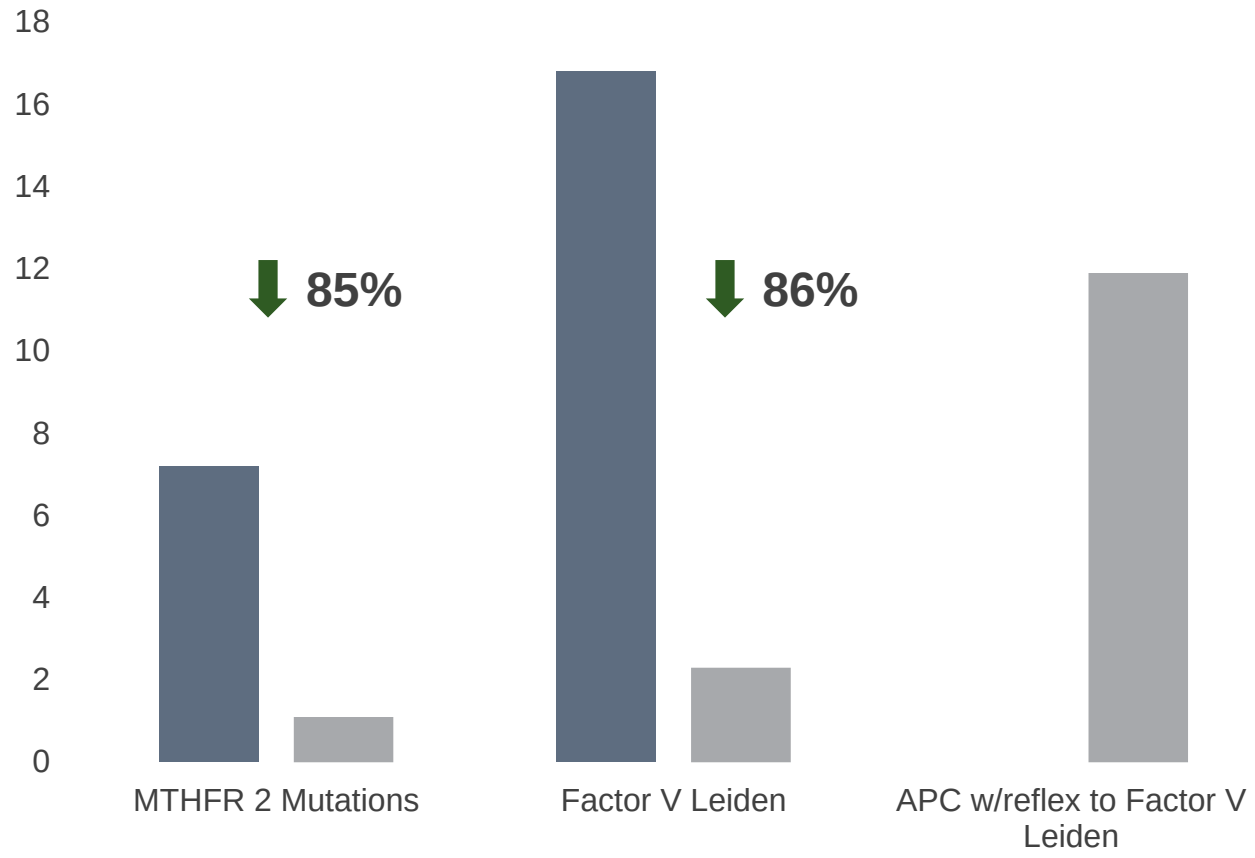
POE Optimization

- [ ] CELIAC SEROLOGY (REF,$$,3d)
- [ ] IMMUNOGLOBULIN E (IGE) (REF,$$,5d)
- [ ] LEVETIRACETAM LEVEL (REF,$$,2d)
- [ ] PROTEIN C/S PANEL, FUNCTIONAL (REF,$$,3d)
- [ ] RENIN (REF,$$,2d)
- [ ] THYROID Abs (REF,$$,2d)
- [ ] ALPHA-FETOPROTEIN (AFP) (REF,$$,3d)
- [ ] B2 GLYCOPROTEIN I ABS IGG IGM (REF,$$,3d)
- [ ] BUPRENORPHINE and METABOLITES, URINE (REF,$$,5d)
- [ ] CARDIOLIPIN Abs (IgG, IgM, IgA) (REF,$$,2d)
- [ ] GLUTAMIC ACID DECARBOXYLASE AB (REF,$$,4d)
- [ ] ISLET CELL (REF,$$,4d)
- [ ] LAMOTRIGINE LEVEL (REF,$$,2d)
- [ ] OXCARBAZEPINE (TRILEPTAL) (REF,$$,3d)
- [ ] THYROID STIMULATING IMMUNOGLOB (REF,$$,3d)
- [ ] THYROXINE BINDING GLOBULIN (REF,$$,3d)
- [ ] TISSUE TRANSGLUTAMINASE IGA AB (REF,$$,3d)
- [ ] TOPIRAMATE (TOPRAMAX) LEVEL (REF,$$,3d)
- [ ] TPMT ENZYME (REF,$$,2d)
- [ ] VON WILLEBRAND MULTIMERIC PANEL (REF,$$,4d)
- [ ] ACTIVATED PROTEIN C RESISTANCE (REF,$$,5d)
- [ ] ADRENOCORTICOTROPHIC HORMONE (ACTH) (REF,$$,3d)
- [ ] ALDOSTERONE, SERUM (REF,$$,5d)
- [ ] ALDOSTERONE/RENIN ACT RATIO (REF,$$,6d)

	Inpatient Reference test cost
Monthly average pre Formulary	**$31,054**
Monthly average post Formulary	**$20,028**
Percent decrease	**35%**
Average monthy savings	**$11,026**
Projected yearly savings	**$132,309**

Commonly Misordered Testing

Test Removal & Reflex Path Implementation



Where to Start?

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Inappropriate test intervals

Daily Orders

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

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

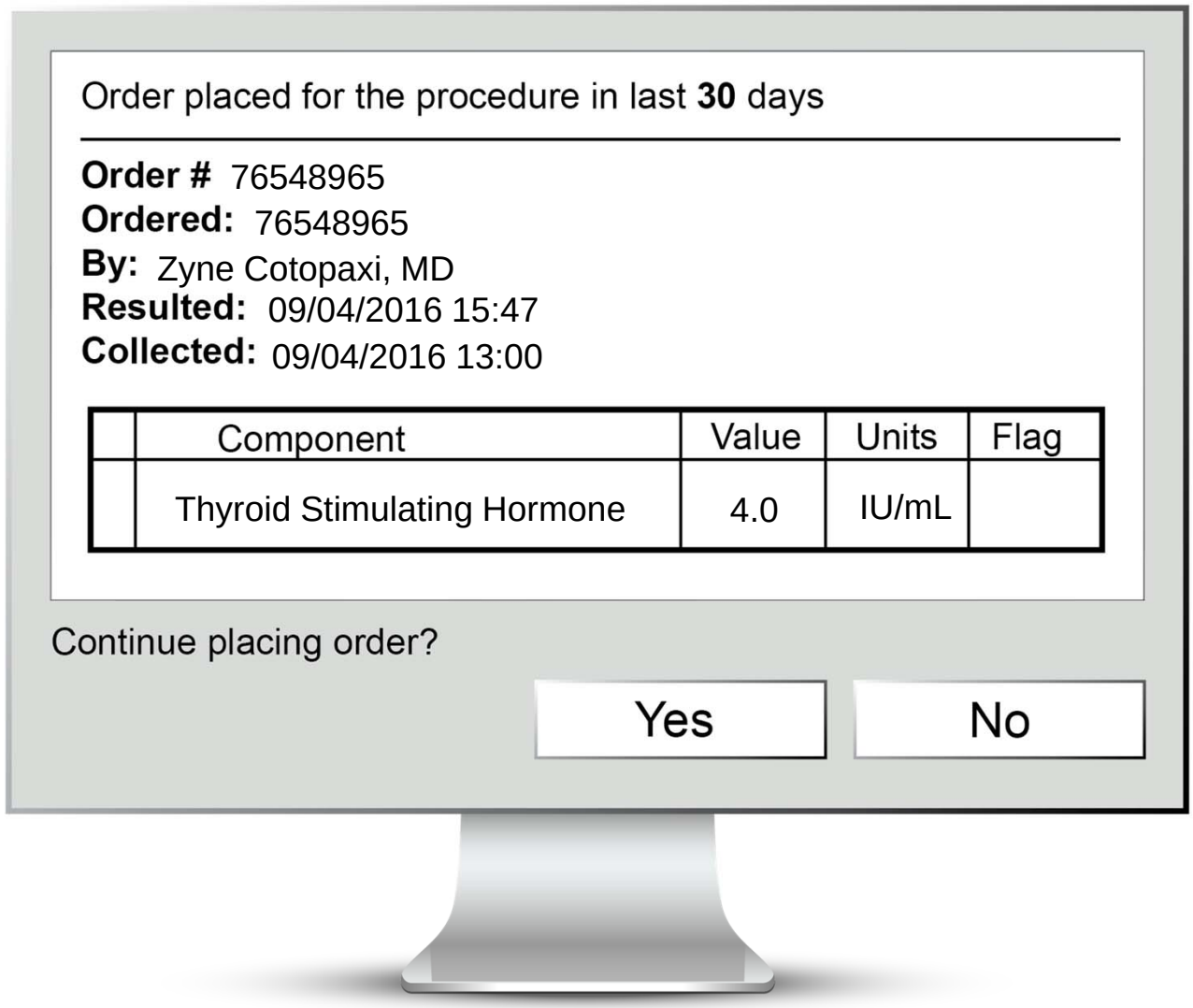
Intervention Methods

Proactive

Appropriate order sets
Order management
Preference list management
Physician education
Physician report cards

Reactive

Duplicate alerts
Formulary restriction alerts
Best Practice Alerts
Physician education


Order placed for the procedure in last **30** days
Order # 76548965
Ordered: 76548965
By: Zyne Cotopaxi, MD
Resulted: 09/04/2016 15:47
Collected: 09/04/2016 13:00
Component
Value
Units
Flag
Thyroid Stimulating Hormone
4.0
IU/mL
Continue placing order?
Yes
No

Summary

Justification for Stewardship

NCLS Recommendations

Three Initial areas of Focus:

Test Consolidation

- How many reference labs do you use?

Reference test formulary

- Creation & Implementation

In-House Testing

- Daily recurring labs
- Inappropriate test intervals

13 Billion

laboratory tests performed annually in the U.S.

70%

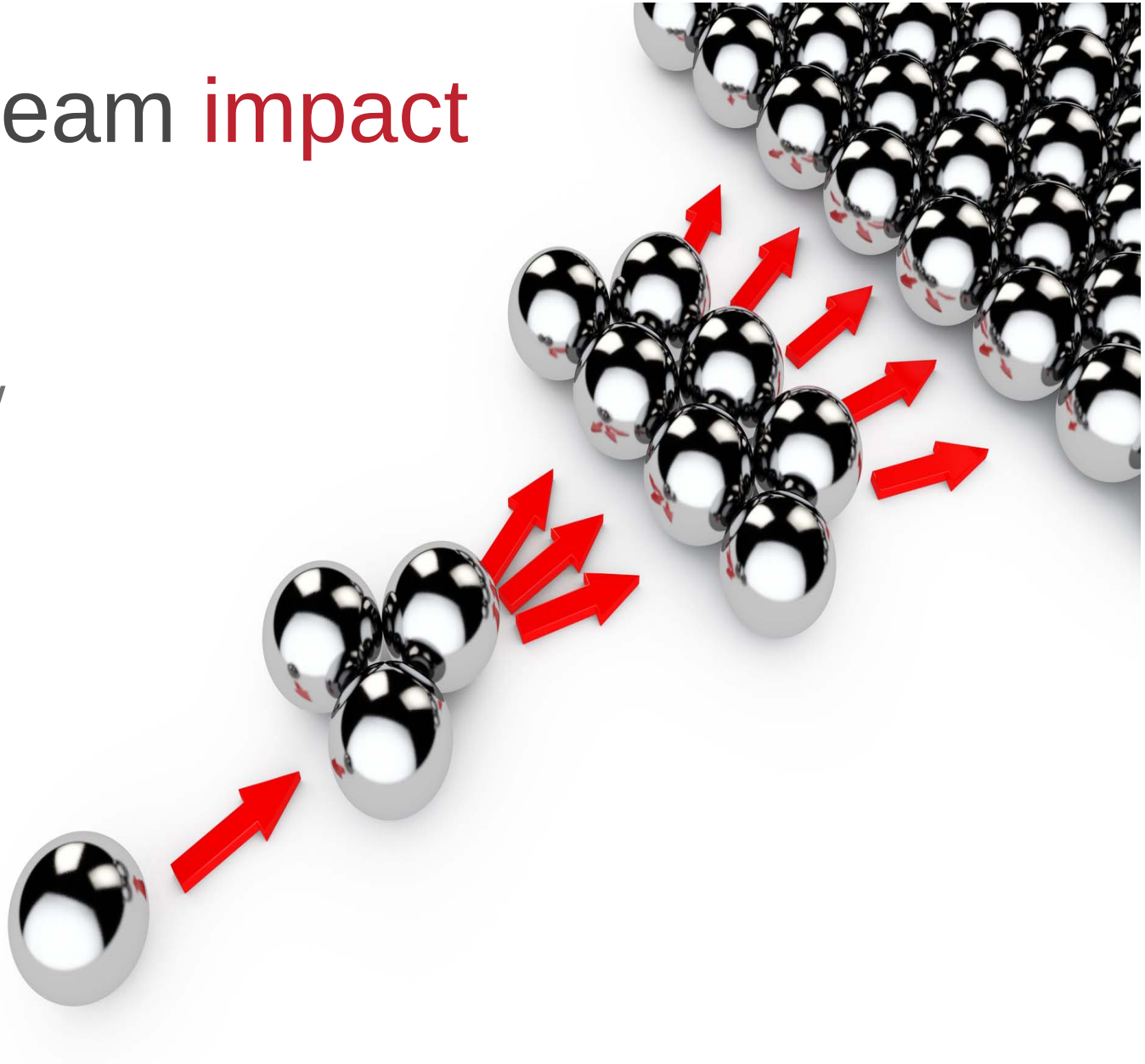
of medical decisions are influenced by laboratory data

3%

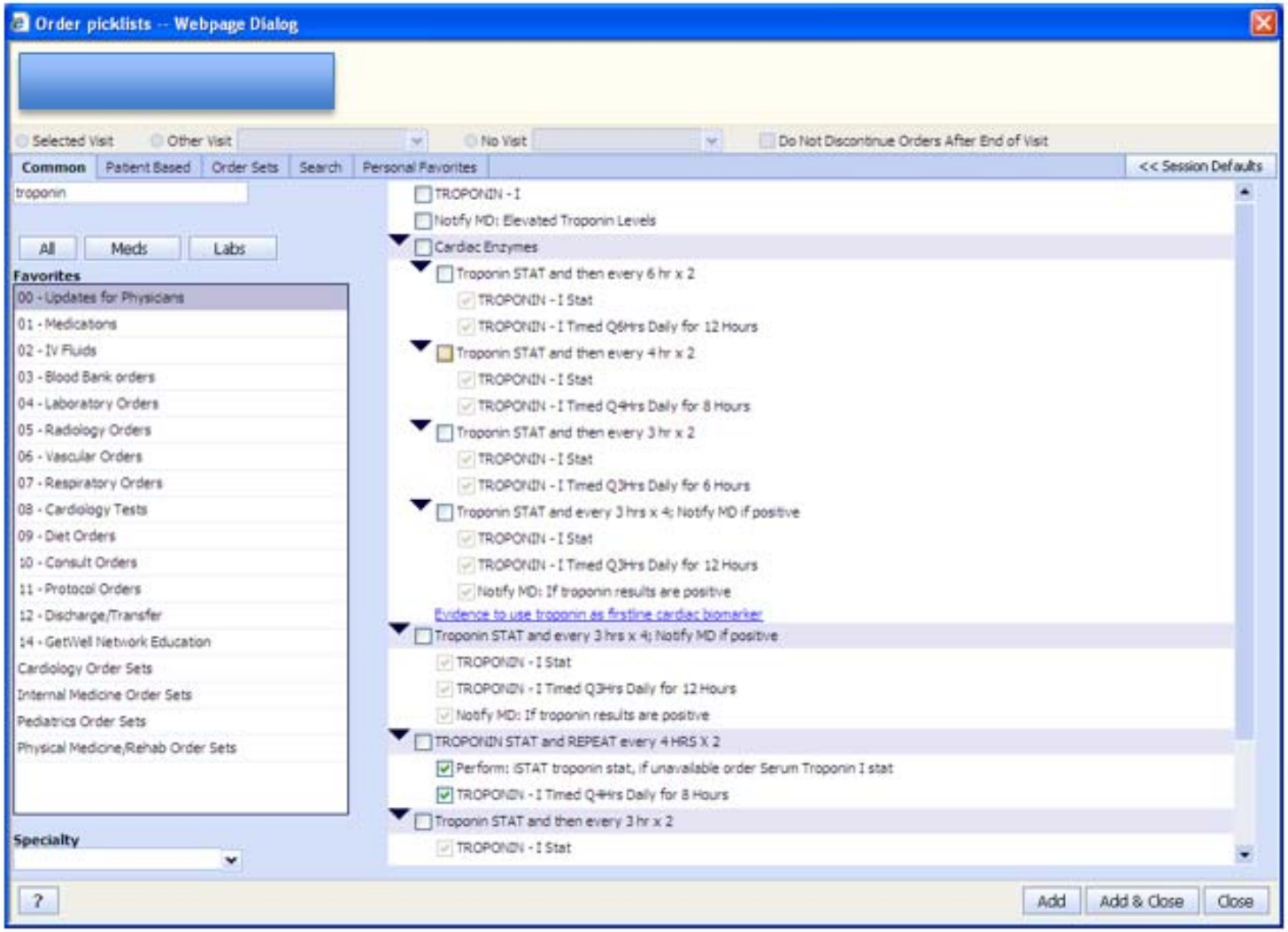
of U.S. healthcare expenditures spent on Laboratory Services

Downstream impact

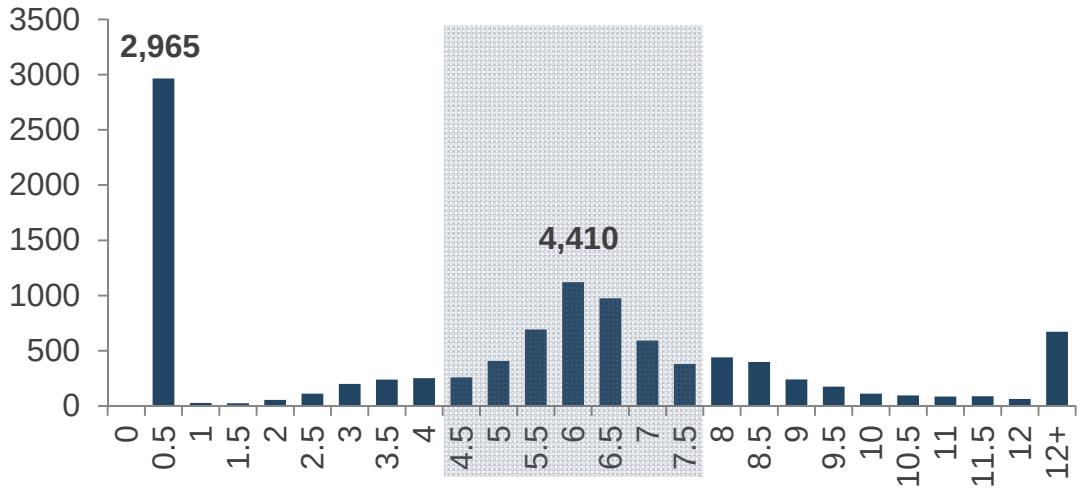
- Length of stay
- Pharmacy
- Radiology
- Others……



Troponin orders and Chest Pain LOS



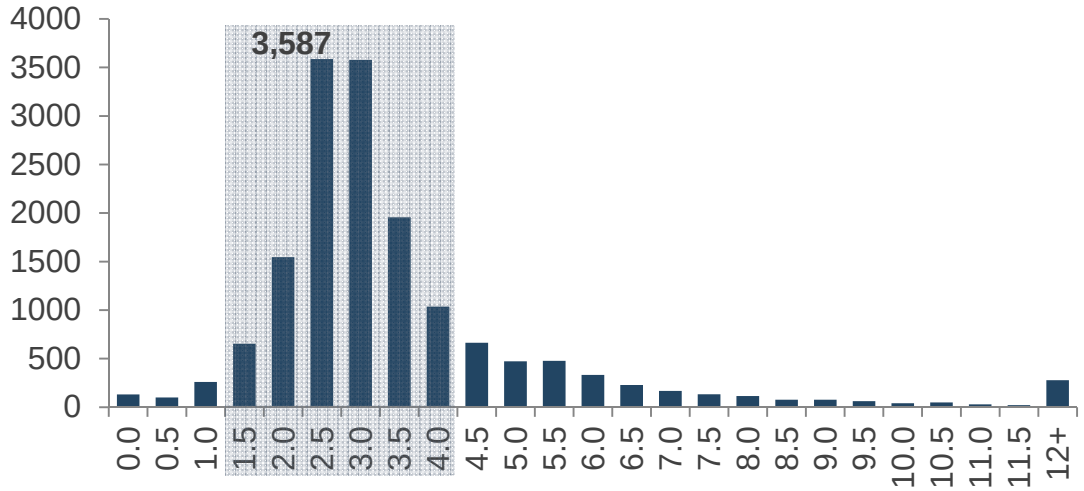
TROPONIN I



1. Identify order mechanisms that drive the repeat interval
2. Modify the repeat time to be 3-6 hours after

Improve the time-to-decision by improving the test interval by up to **3 hours**

TROPONIN I



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Downstream impact

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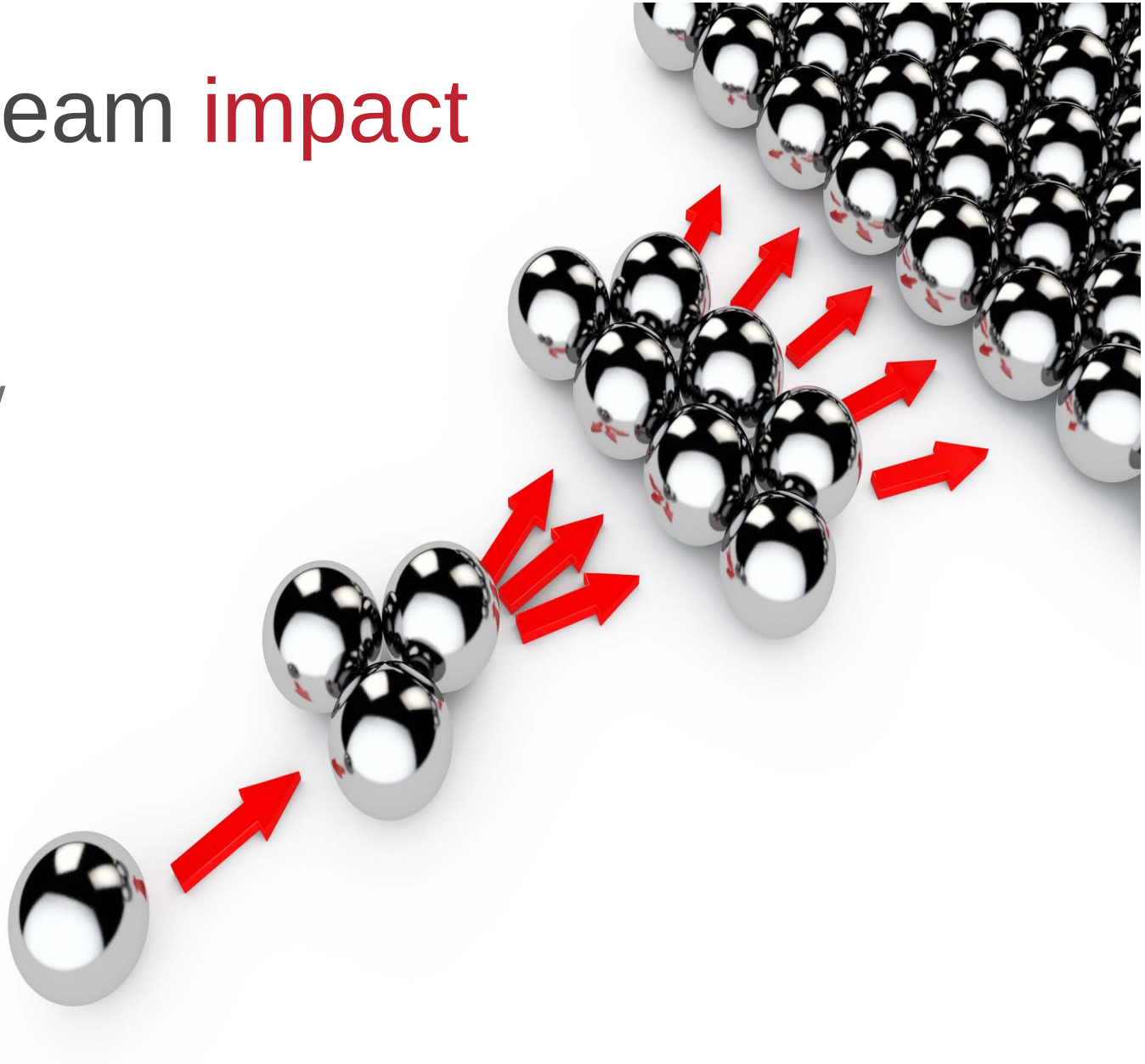
- Radiology
- Others……



Downstream Impact on Pharmacy

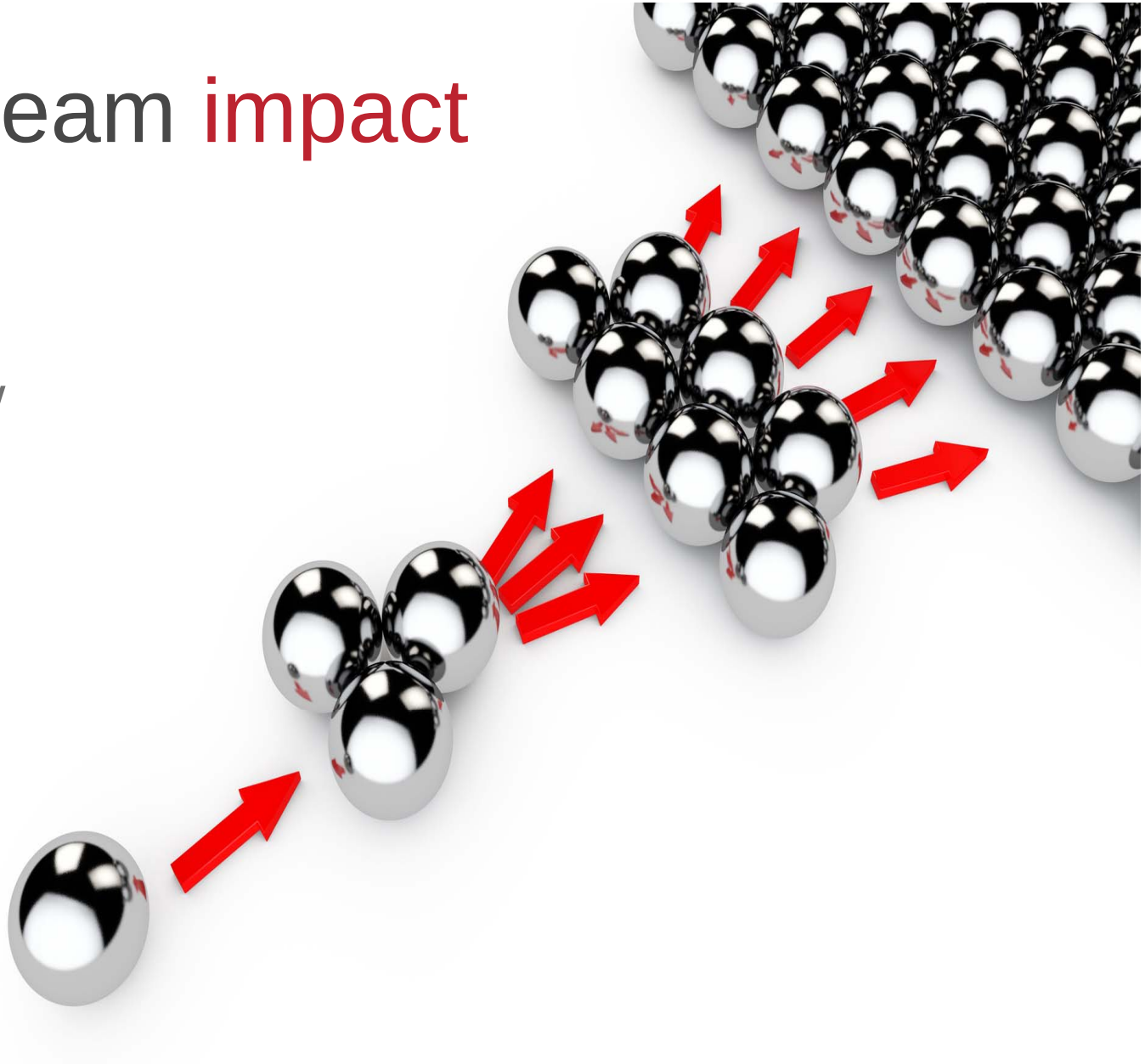
IVIG

Argatroban

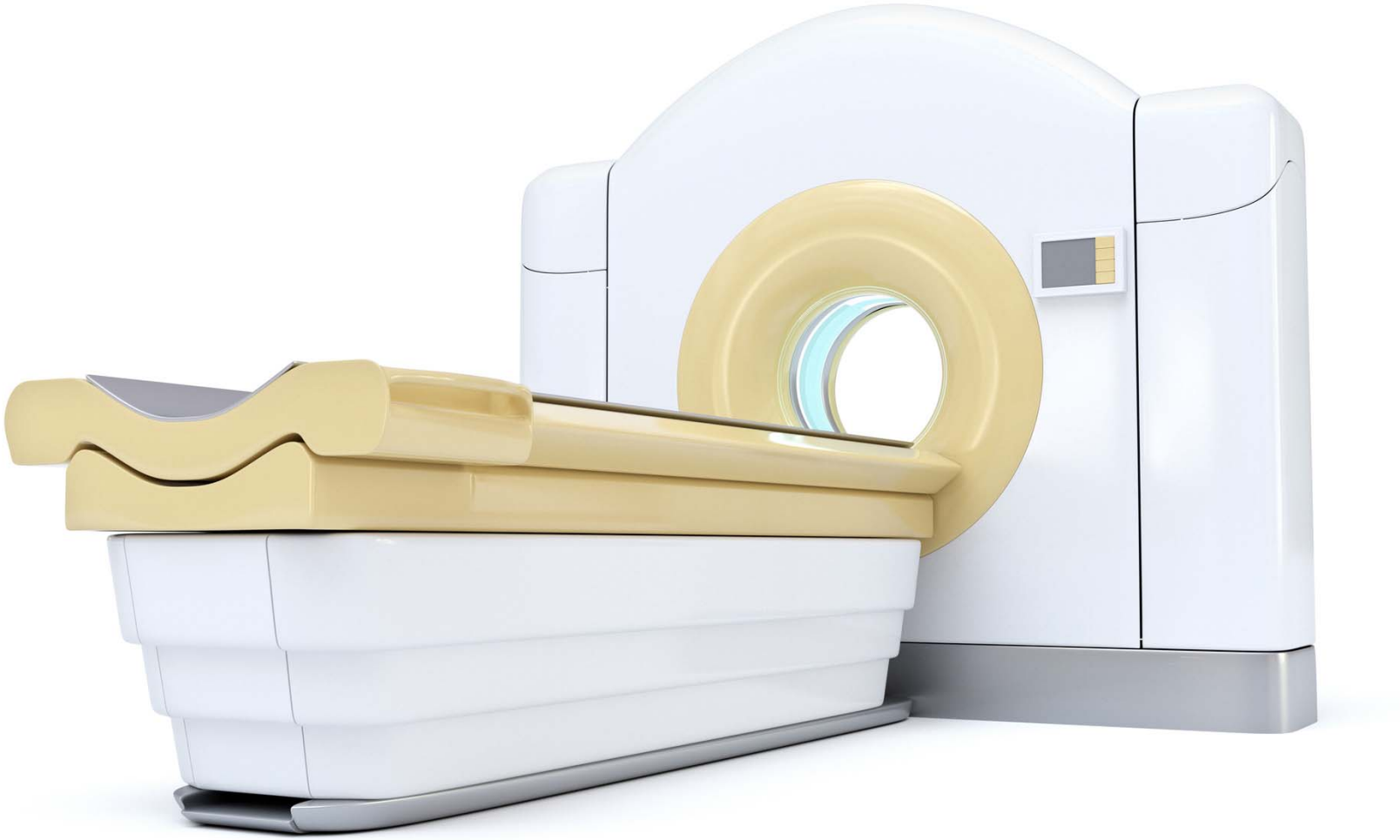
Remicade

Downstream impact

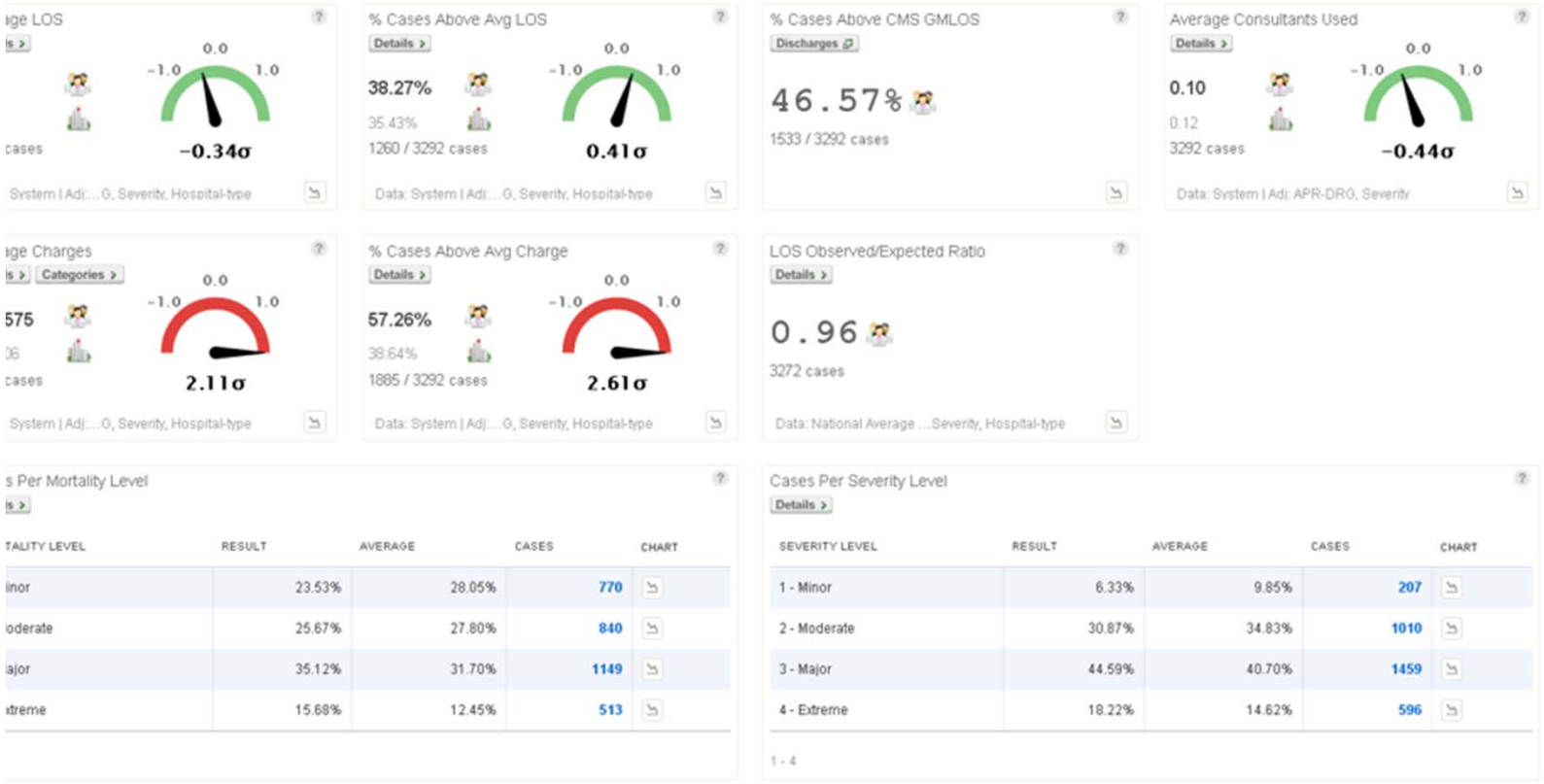
- Length of stay
- Pharmacy
- Radiology
- Others……



Radiology Services



CT PE Protocol



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American College of Chest Physicians and American Thoracic Society

View all recommendations from this society

Released October 27, 2013

Don't perform chest computed tomography (CT angiography) to evaluate for possible pulmonary embolism in patients with a low clinical probability and negative results of a highly sensitive D-dimer assay.

Clinical practice guidelines for pulmonary embolism indicate that the cost and potential harms of CT angiography (including radiation exposure and the possibility of detecting and treating clinically insignificant pulmonary emboli with anticoagulation) outweigh the benefits for patients with a low pre-test probability of pulmonary embolism. In patients with a low clinical prediction score (e.g., Wells or Geneva score) followed by a negative D-dimer measured with a high sensitivity test (e.g., ELISA), pulmonary embolism is effectively excluded and no further imaging is indicated for pulmonary embolism evaluation.

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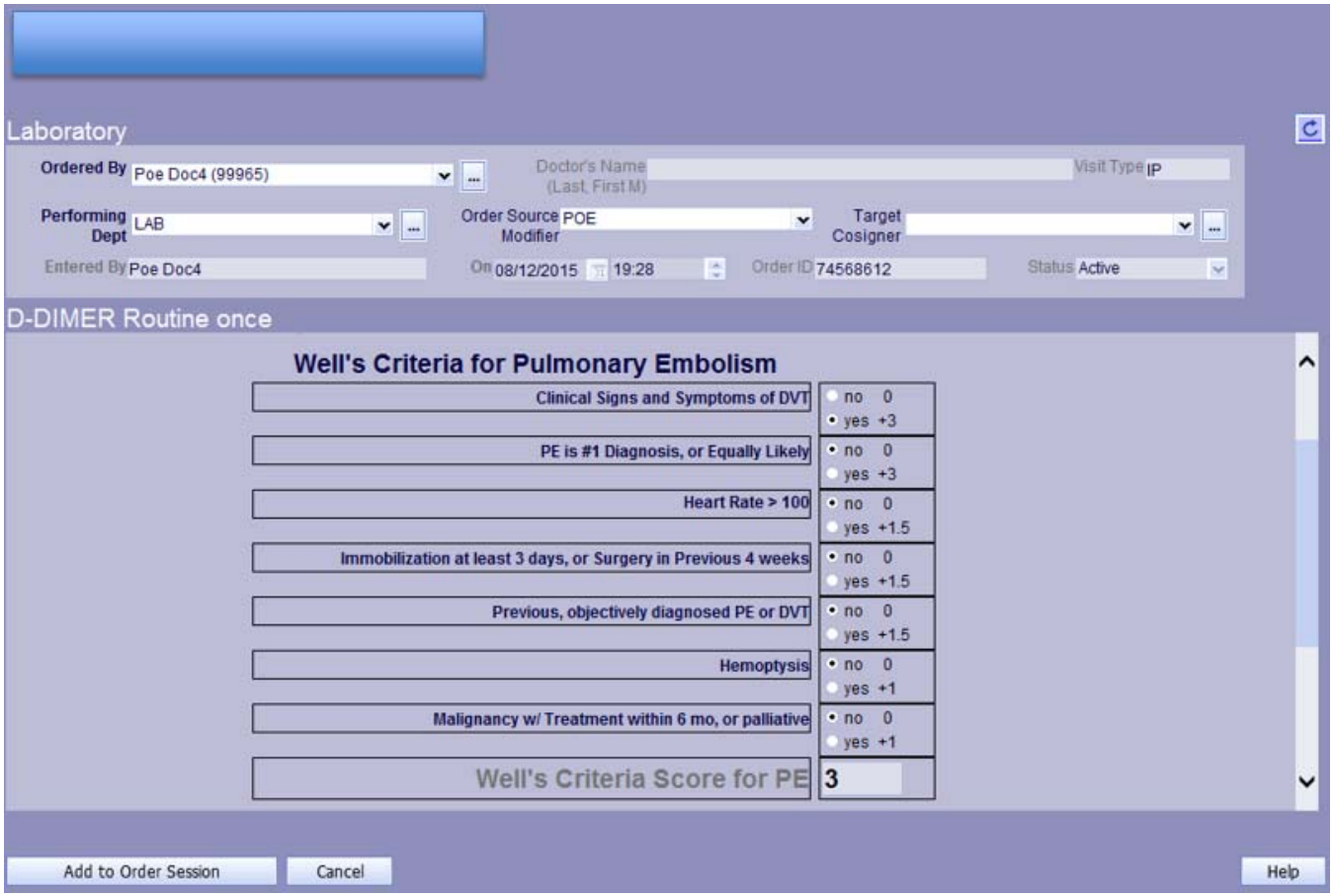
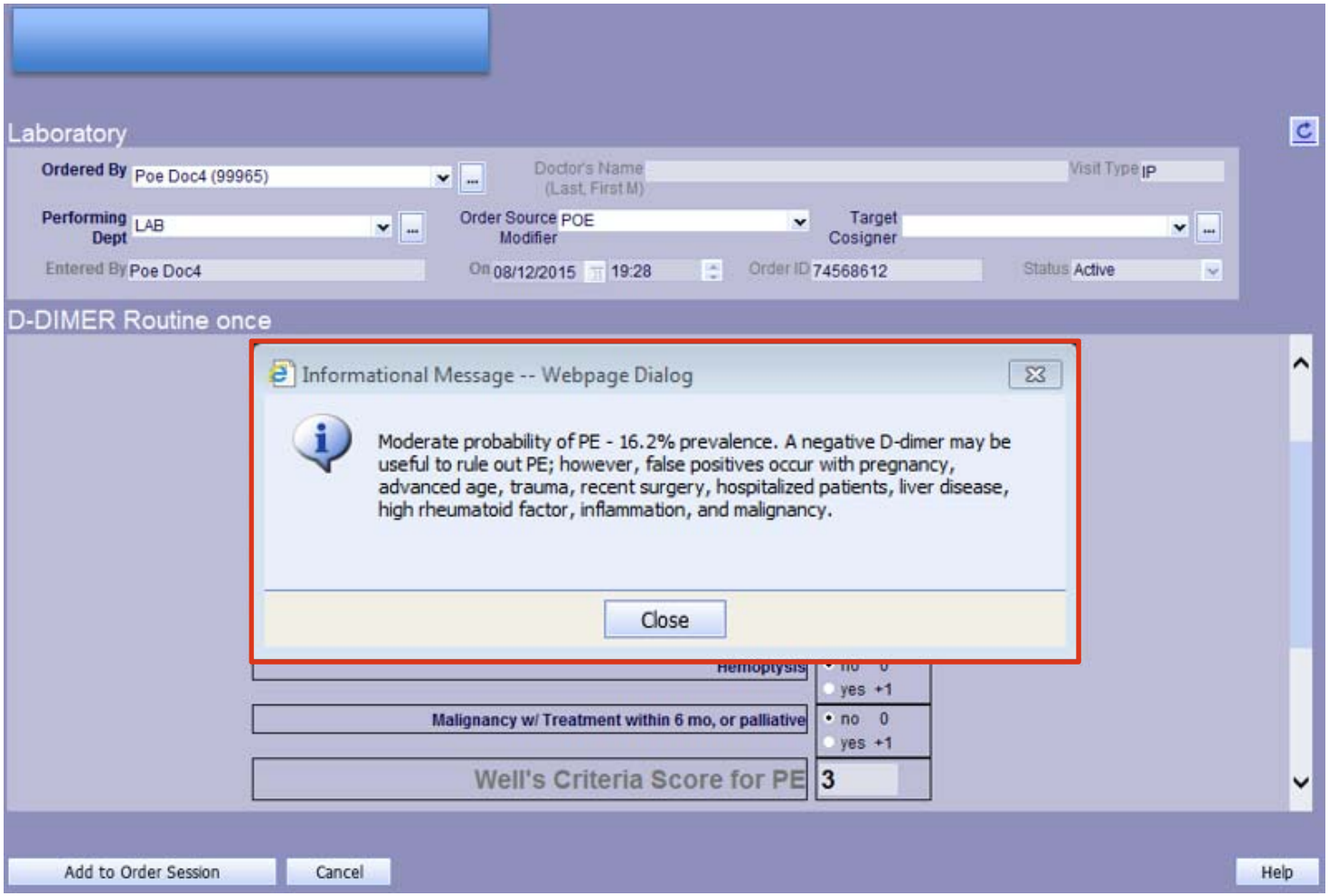
ATS® We help the world breathe® PULMONARY • CRITICAL CARE • SLEEP

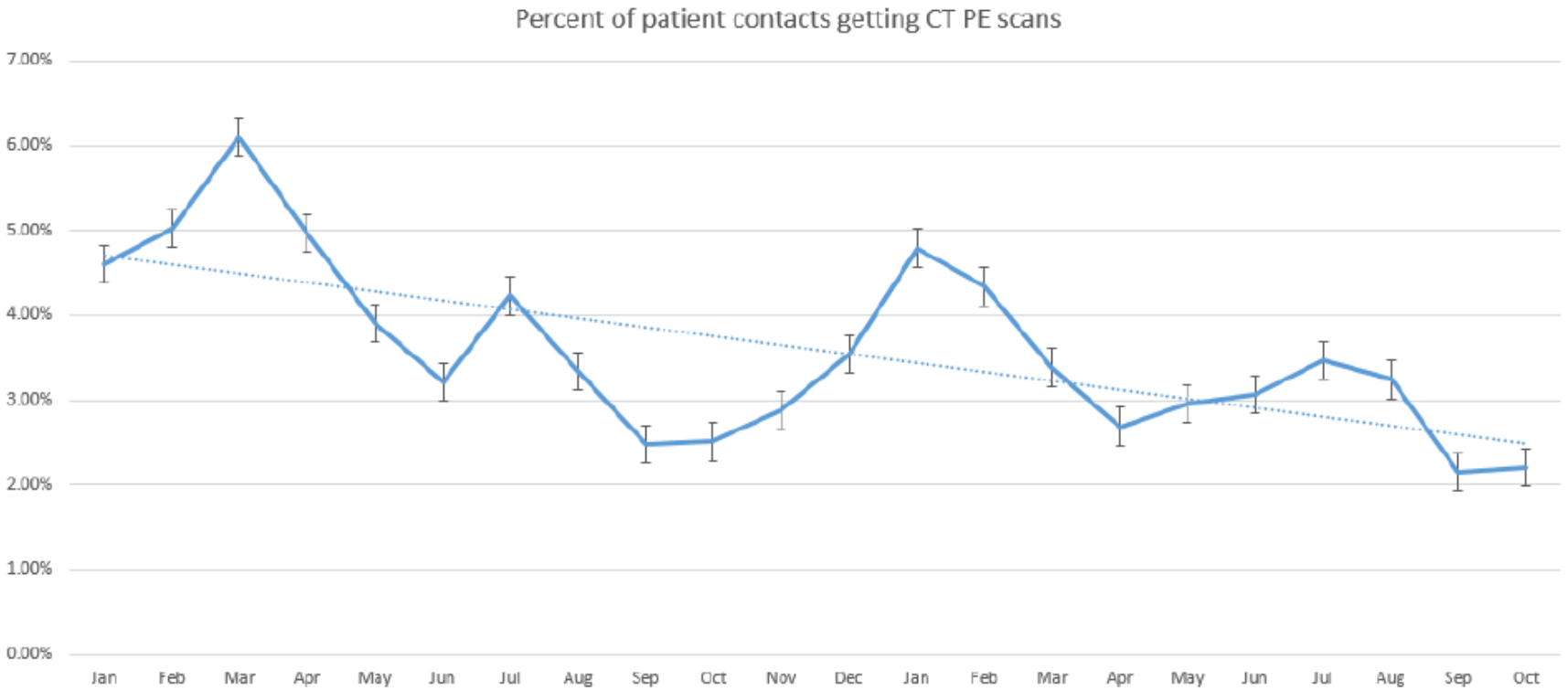
Patient Materials

- Search patient-friendly resources by Consumer Reports.

D-Dimer and CT PE Protocol




Laboratory
Ordered By Poe Doc4 (99965)
Doctor's Name (Last, First M)
Visit Type IP
Performing Dept LAB
Order Source Modifier POE
Target Cosigner
Entered By Poe Doc4
On 08/12/2015 19:28
Order ID 74568612
Status Active
D-DIMER Routine once
Informational Message -- Webpage Dialog
Moderate probability of PE - 16.2% prevalence. A negative D-dimer may be useful to rule out PE; however, false positives occur with pregnancy, advanced age, trauma, recent surgery, hospitalized patients, liver disease, high rheumatoid factor, inflammation, and malignancy.
Close
Hemoptysis
yes +1
Malignancy w/ Treatment within 6 mo, or palliative
no 0
yes +1
Well's Criteria Score for PE
3
Add to Order Session
Cancel
Help



Average percent of patients receiving CT PE scan in months prior to Aug 2015 (n=7) = 4.58%

Average percent of patients receiving CT PE scan in months after Aug 2015 (n=15) = 3.14%

(two sample t-test, $p<0.05$)

23% ↓

CT Scans

=

45,000

chest x-rays

23% ⬇

CT Scans

=

$34.20

per scan

23% ⬇

CT Scans

=

$10,260

cost saving

23% ⬇

CT Scans

=

$1,445,400

savings for patients

23% ⬇

CT Scans

=

360 hrs

reduction in LOS

Downstream impact

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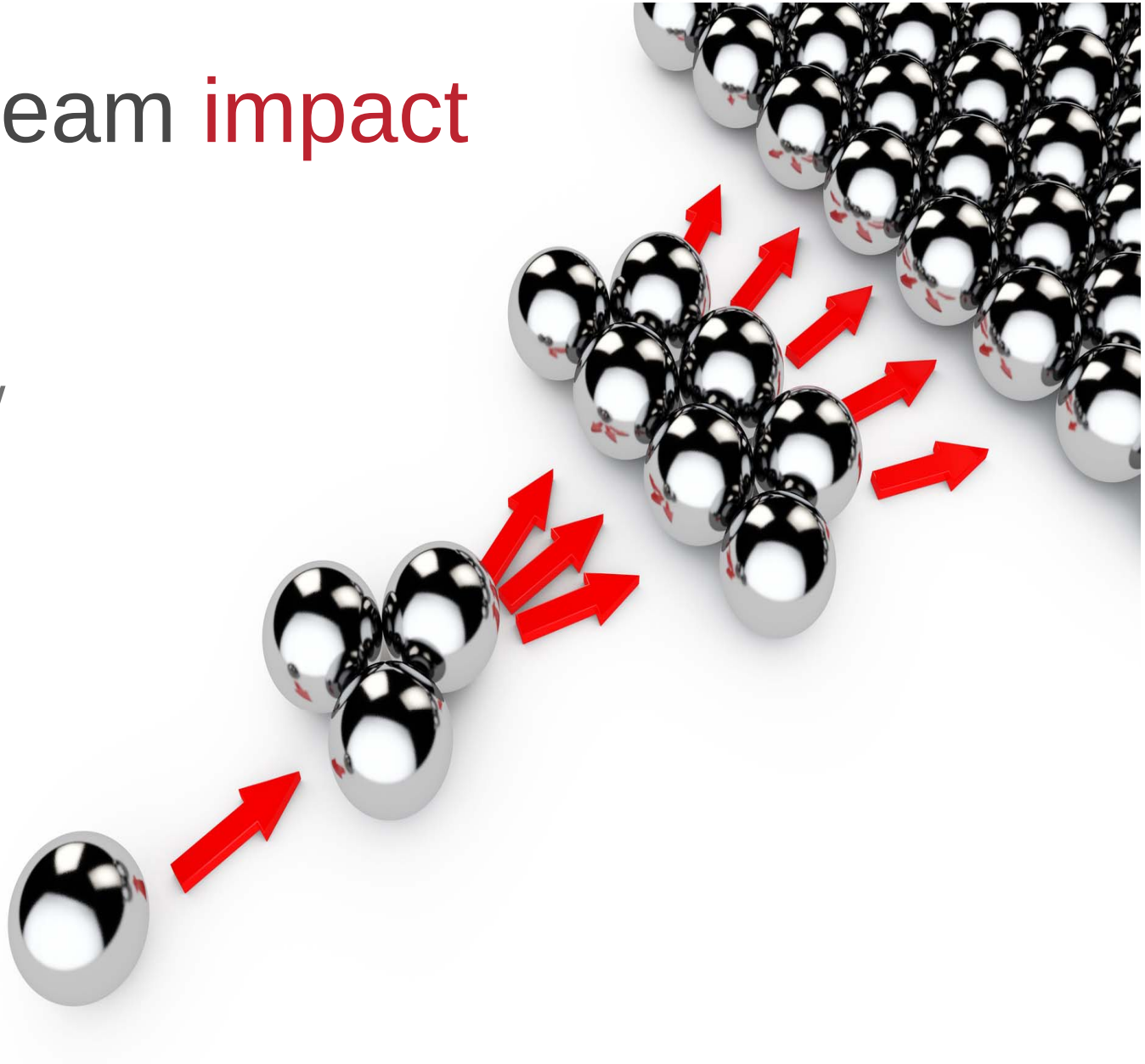

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