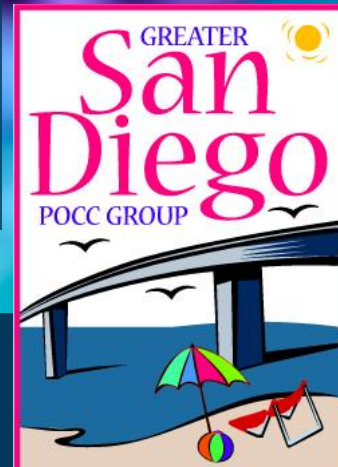


Demonstrating the Value of the Laboratory Partnerships with Case Management

Andrew Fletcher, MD, MBA, CPE, CHCQM, FCAP

Learning Objectives

- Identify and discuss potential laboratory strategies to address length of stay issues
- Describe how laboratory tests can impact transitions of care and readmissions
- Demonstrate how laboratory tests can influence denials in payment due to medical necessity
- Discuss how laboratory testing can improve hospital acquired conditions



Definition of Case Management

Case management is a collaborative process of assessment, planning, facilitation, care coordination, evaluation, and advocacy for options and services to meet an individual's and family's comprehensive health needs through communication and available resources to **promote patient safety, quality of care, and cost-effective outcomes.**

<https://www.cmsa.org/who-we-are/what-is-a-case-manager/>

§ 482.30 Condition of participation: Utilization review.

- The hospital must have in effect a utilization review (UR) plan that provides for review of services furnished by the institution and by members of the medical staff to patients entitled to benefits under the Medicare and Medicaid programs.

<https://www.law.cornell.edu/cfr/text/42/482.30>



Medicare Incentive Programs

3% Penalty

Hospital Readmissions Reduction Program (HRRP)
https://qualitynet.cms.gov/files/5f294d57f75e42002168c687?filename=FY2021_HRRP_FAQs.pdf

2% Penalty
(or Bonus)

Hospital Value-Based Purchasing Program (VBP)
<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Hospital-Value-Based-Purchasing->

1% Penalty

Hospital-acquired condition Reduction Program (HACRP)
<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/HAC/Hospital-Acquired-Conditions>

6% Penalty

How Safe is Your Hospital?

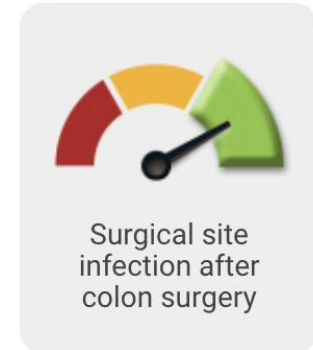
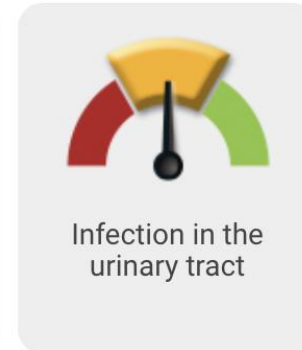
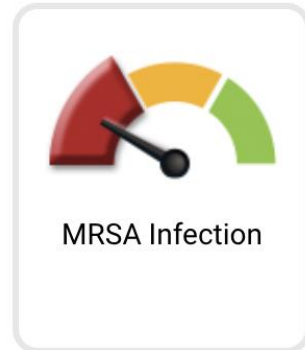
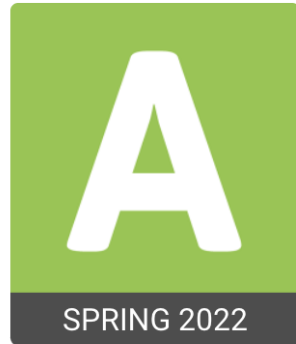
Search By City/State
Hospital Search Form

City

- Choose -

Search

This Hospital's Grade



<https://www.hospitalsafetygrade.org/state-rankings>



Topics Covered

Length of Stay

Transitions of Care

Denial of Payment

Readmissions

Hospital-Acquired Conditions



Length of Stay

Patients with Chest Pain

Login

Find & compare nursing homes, hospitals & other providers near you.

[Learn more about the types of providers listed here](#)

Timely & effective care

Average (median) time patients spent in the emergency department
before leaving from the visit

↓ *A lower number of minutes is better*

226 minutes

Other Very High volume
hospitals:

Nation: 169 minutes [25,26](#)



<https://www.medicare.gov/care-compare/>

CK-MB versus Troponin

- Choosing Wisely guidelines recommend against using CK-MB

1,713 CK-MB tests ordered

3-4 serial tests q6 hours

18-hour CK-MB rule out

17,878 troponin tests ordered

3 serial tests q3 hours

6-hour troponin rule out

<https://www.choosingwisely.org/clinician-lists/american-society-clinical-pathology-myoglobin-to-diagnose-acute-myocardial-infarction/>



AMERICAN
COLLEGE *of*
CARDIOLOGY

Journal of the American College of Cardiology

[JACC Journals](#) › [JACC](#) › [Archives](#) › Vol. 72 No. 18

[Previous](#) | [Next](#)

Fourth Universal Definition of Myocardial Infarction (2018)

Expert Consensus Document

Kristian Thygesen, Joseph S. Alpert, Allan S. Jaffe, Bernard R. Chaitman, Jeroen J. Bax, David A. Morrow, Harvey D. White, and
... [SEE ALL AUTHORS](#) ▼

J Am Coll Cardiol. 2018 Oct, 72 (18) 2231–2264

<https://www.jacc.org/doi/full/10.1016/j.jacc.2018.08.1038>

AACC

Better health through
laboratory medicine.

Clinical Chemistry

Best Practices for Monitoring Cardiac Troponin in Detecting Myocardial Injury FREE

Fred S Apple ✉, Allan S Jaffe, Scott Sharkey, Peter Kavsak, Michael C Kontos,
Amy K Saenger, Stephen Smith

Clinical Chemistry, Volume 63, Issue 1, 1 January 2017, Pages 37–44,
<https://doi.org/10.1373/clinchem.2016.257428>

Published: 01 January 2017 **Article history** ▼

<https://www.aacc.org/cln/articles/2014/may/cardiac-troponin>

CLN

Cardiac Troponin

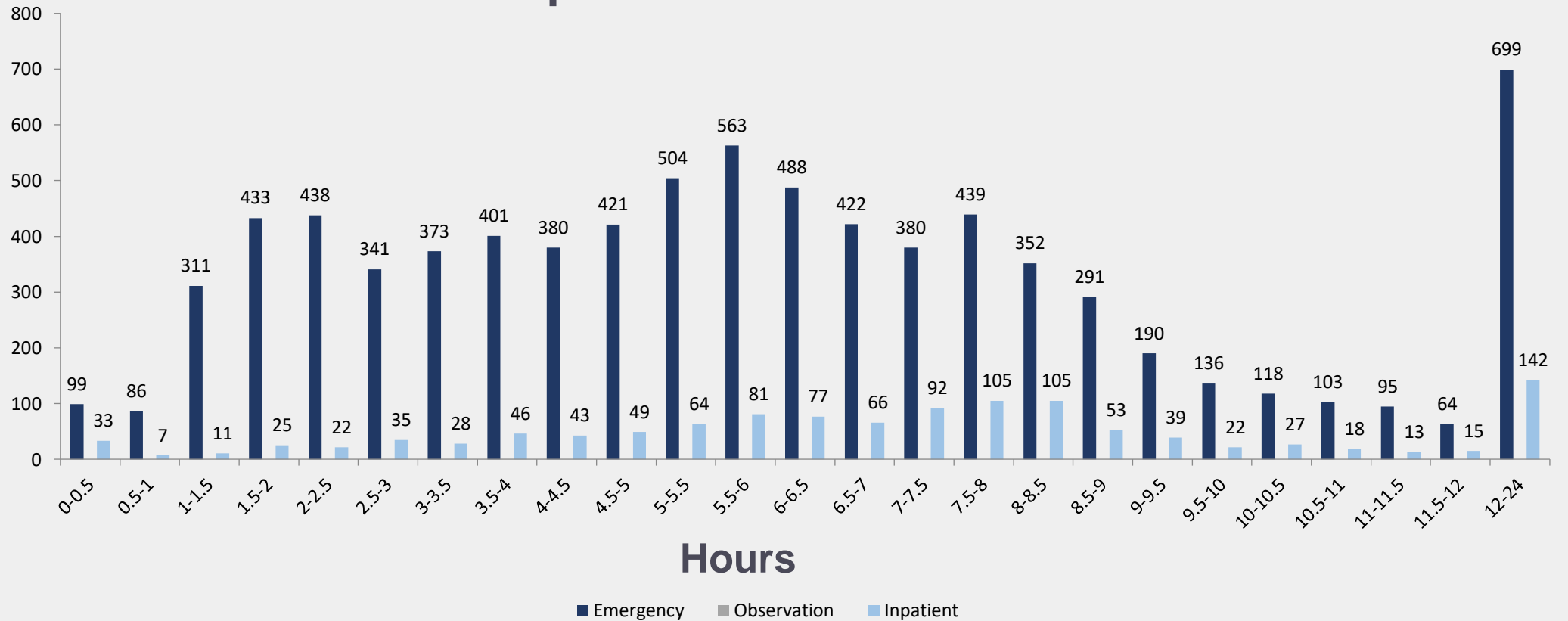
Serial Ordering Recommendations: For Today and Tomorrow

Author: Sara Love, PhD, and Fred Apple, PhD, DABCC // **Date:** MAY.1.2014 // **Source:**
Clinical Laboratory News

<https://academic.oup.com/clinchem/articles/63/1/37/5612807>

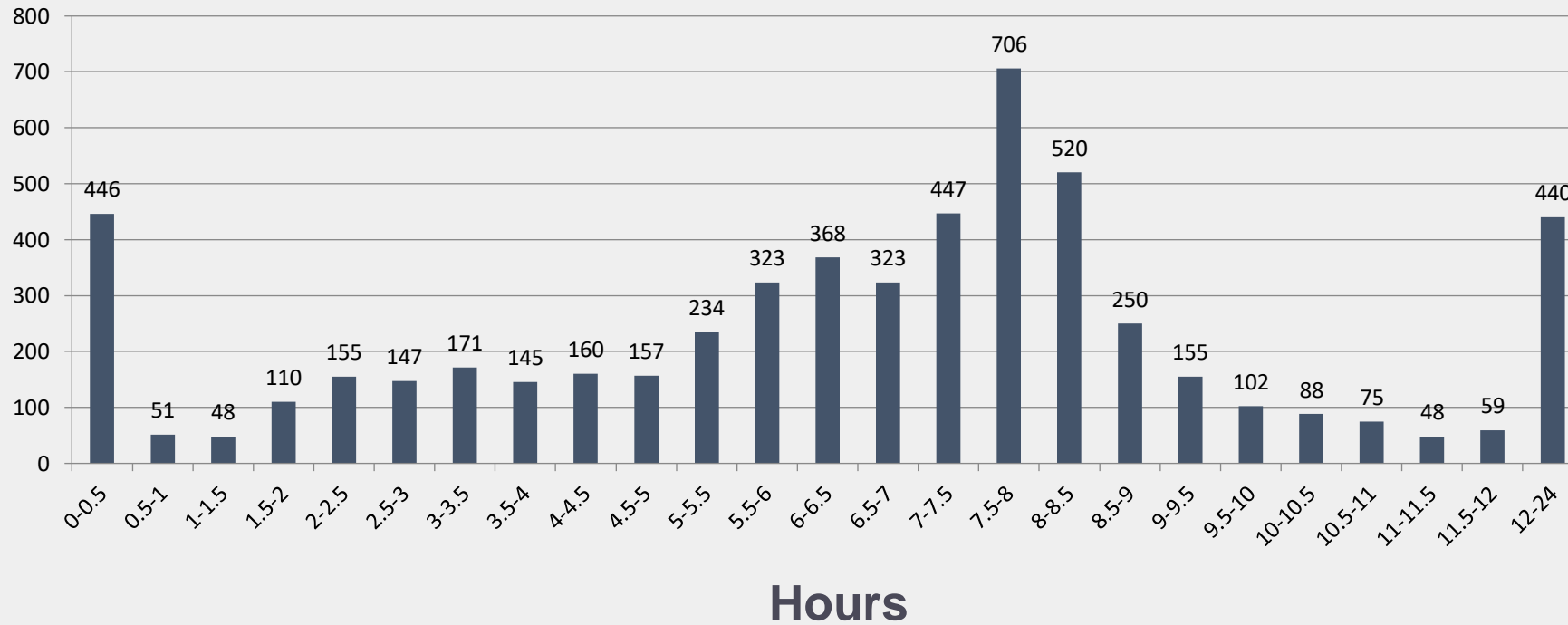
Troponin Interval Example #1

Troponin I Collection Time



Troponin Interval Example #2

Troponin I Collection Time



“Every system is perfectly designed to get the result that it does.”

—W. Edwards Deming

CAR ACS Admission [3045000884]

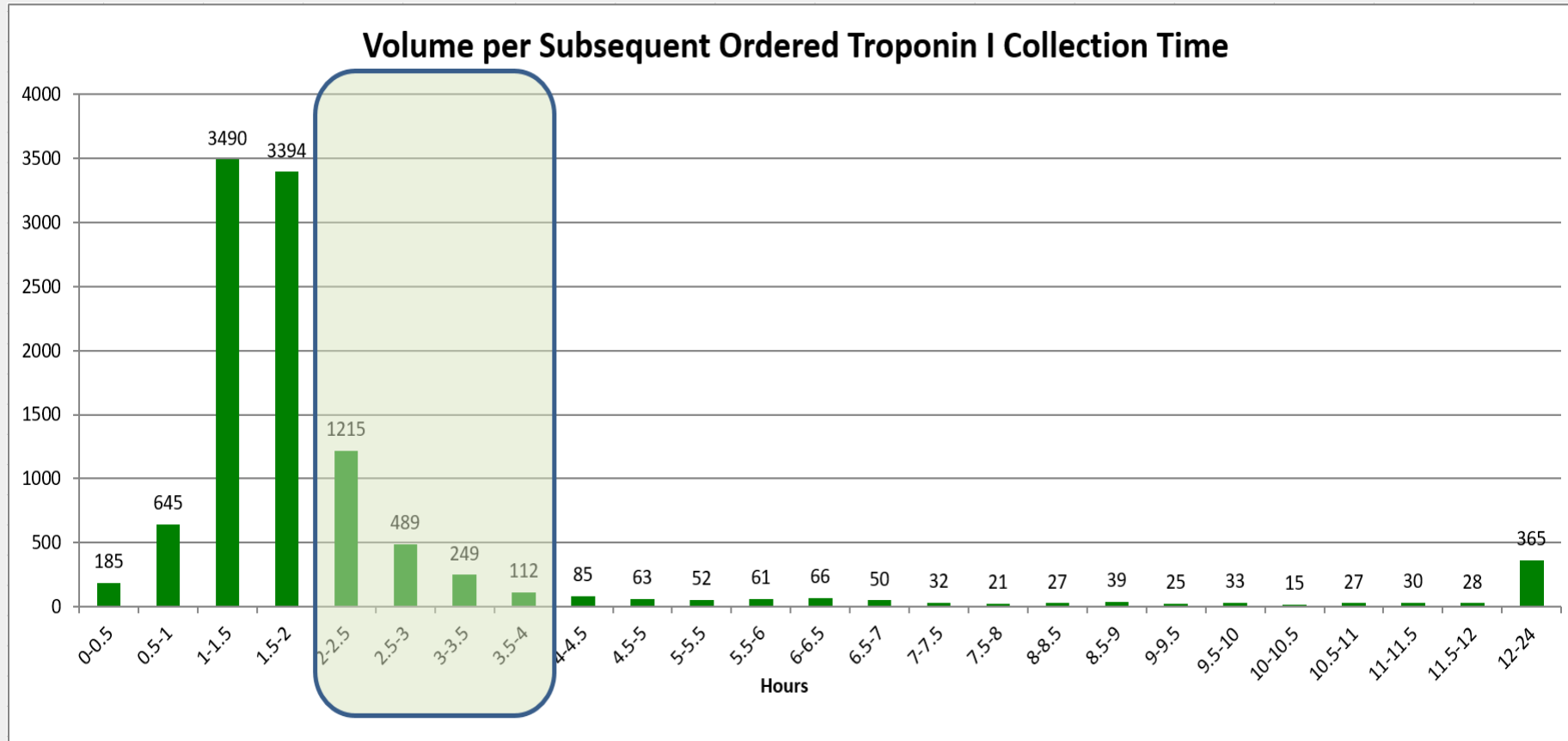
Code Status

Laboratory

Lab - Cardiac Markers

- | | | |
|-------------------------------------|---|---|
| <input type="checkbox"/> | CK MB Panel | Every 8 hours - Lab For 2 Occurrences
Do you want to change the specimen collection from what it shows in the banner bar? No |
| <input type="checkbox"/> | Creatine Kinase, Total, Serum Or Plasma | Every 8 hours - Lab For 2 Occurrences
Do you want to change the specimen collection from what it shows in the banner bar? No |
| <input checked="" type="checkbox"/> | Troponin I | Every 8 hours - Lab For 2 Occurrences
Do you want to change the specimen collection from what it shows in the banner bar? No |
| <input type="checkbox"/> | B-Type Natriuretic Peptide | Once - Routine - Lab
Do you want to change the specimen collection from what it shows in the banner bar? No |

Troponin Interval Example #3



The Journal of
APPLIED LABORATORY MEDICINE

Analysis of Inpatient and Emergency Department Serial Troponin Testing Intervals in the United States

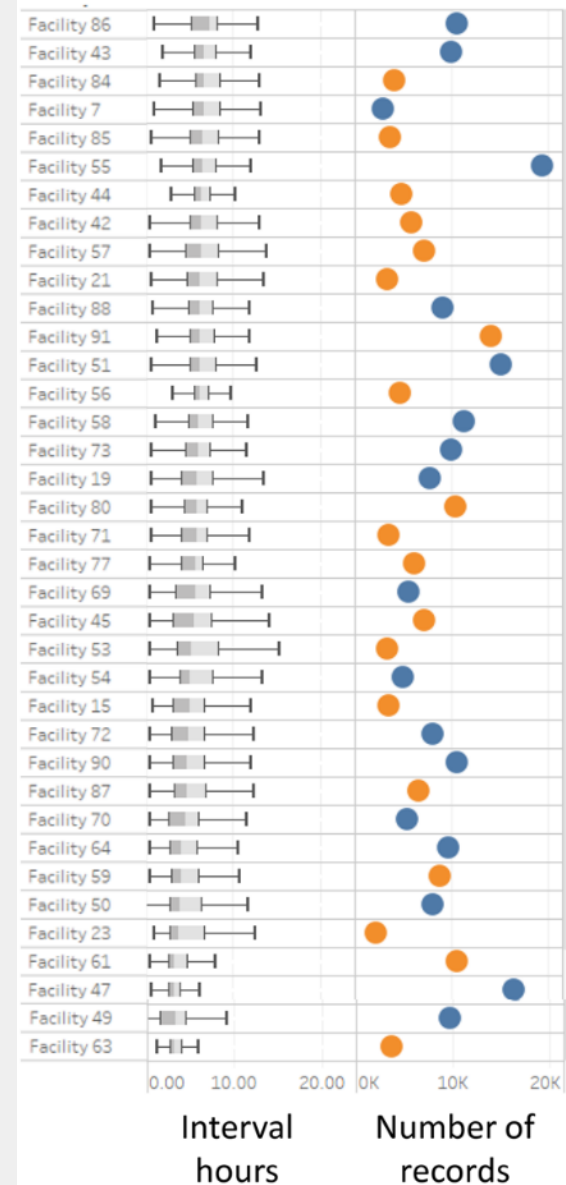
Andrew Fletcher ✉, Erik Forsman, Brian R Jackson

The Journal of Applied Laboratory Medicine, jfaa185,
<https://doi.org/10.1093/jalm/jfaa185>

Published: 09 November 2020 **Article history** ▼

<https://pubmed.ncbi.nlm.nih.gov/33169147/>

Inpatient cTn Intervals



Recommendations



Discuss
intervals



Review
order sets



Standardize
ordering protocol



Topics Covered

Length of Stay

Transitions of Care

Denial of Payment

Readmissions

Hospital-Acquired Conditions



Transition of Care

Test Pending At Discharge (“TPADs”)

Login

Find & compare nursing homes, hospitals & other providers near you.

[Learn more about the types of providers listed here](#)

Unplanned hospital visits

Overall

Rate of readmission after discharge from hospital (hospital-wide)

18%

Worse than the national rate

National result: 15.6%

Number of included patients:
2382

<https://www.medicare.gov/care-compare/>



Journal of
General Internal Medicine

springer.com

[This journal](#)

[Toc Alerts](#)

[Submit Online](#)

[Open Choice](#)

[J Gen Intern Med](#). 2018 May; 33(5): 750–758.

PMCID: [PMC5910344](#)

Published online 2018 Jan 19. doi: [10.1007/s11606-017-4290-9](https://doi.org/10.1007/s11606-017-4290-9)

PMID: [29352419](#)

A Systematic Review of Interventions to Follow-Up Test Results Pending at Discharge

[Patrick J. Darragh](#), MD, MSc,^{✉1,2} [T. Bodley](#), MD,¹ [A. Orchanian-Cheff](#), BA, MSt,³ [K. G. Shojania](#), MD,¹ [J. L. Kwan](#), MD, MPH,¹ and [P. Cram](#), MD, MBA¹

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5910344/>

41%–100%
of discharges have
at least
1 TPAD

30%-40%
are likely to
change
management

45%
of patients with TPADs
are readmitted

66%
of outpatient
physicians reported
preventable errors



**NATIONAL
QUALITY FORUM**

Driving measurable health
improvements together

Serious Reportable Event, a.k.a. "Never Event"

Patient death or serious injury resulting from failure to follow up or communicate laboratory, pathology, or radiology test results (new)

Applicable in: hospitals, outpatient/office-based surgery centers, ambulatory practice settings/office-based practices, long-term care/skilled nursing facilities

http://www.qualityforum.org/Topics/SREs/List_of_SREs.aspx#sre4

Transition of Care TPADs

28,776

Tests resulted
post-discharge



7,728

Excluding cultures

\$702,624

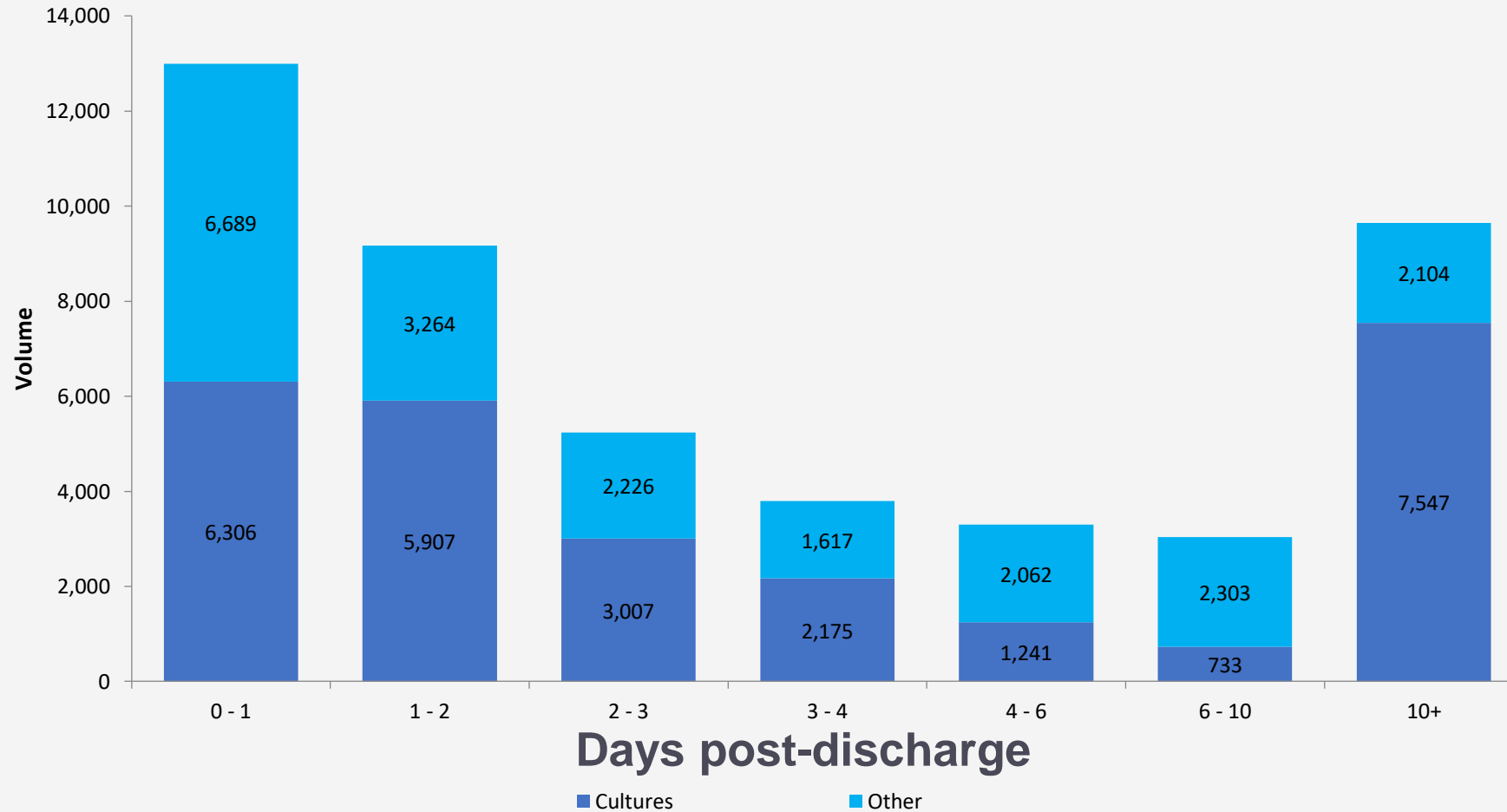
total lab cost



\$290,234

Excluding cultures

Results after Discharge



Top Tests Resulted Post discharge

Test Name	Volume	% Postdischarge
Cytology, Nongynecologic	314	28.6%
Hemoglobin A1c	307	5.4%
CBC with Plt Count and Auto Diff	148	0.2%
Ferritin	121	5.0%
Vitamin B1 (Thiamine), Whole Blood	107	43.1%
Cytomegalovirus DNA Quantitation by PCR	102	10.1%
Tacrolimus by HPLC-MS/MS	101	2.4%
Leuk/Lymph Phenotyping, Flow Cytometry	91	10.2%
Hepatitis B Surface Ag w/ Reflex to Conf	90	6.3%
Serum Protein Electrophoresis Reflex	80	26.7%
Vitamin D, 25-Hydroxy	78	4.1%
ANCA Vasculitis Profile w/Rflx to Titer	76	21.2%
ANA by IFA, IgG	75	22.4%
Drug Screen (Nonforensic), Urine	75	42.1%

Recommendations – EMR TPAD Filter

Chart Review

Encounters Provider Notes Notes **Labs/Path/Micro** Surgery Imaging CV Procedures Anesthesia Medications

Preview | Select All Deselect All | Review Selected | Lab Flowsheet | Route Refresh (9:53 AM) | Add to Bookmarks

Filters Hide Canceled Orders | w/Results Pathology/Cytology Microbiology

Attax Date/Time	Test
1 Year Ago	
03/10/2018 11:46	POC WET MOUNT
3 Years Ago	
06/23/2015	PATHOLOGY SUREPATH PAP REQUEST

Recommendations – EMR TPAD Filter

Chart Review

Encounters Provider Notes Notes **Labs/Path/Micro** Surgery Imaging CV Procedures Anesthesia Medications

Preview | Select All Deselect All | Review Selected | Lab Flowsheet | Route Refresh (9:53 AM) | Add to Bookmarks

Filters Hide Canceled Orders | w/Results Pathology/Cytology Microbiology w/o results genetics

Attax Date/Time	Test
1 Year Ago	
03/10/2018 11:46	POC WET MOUNT
3 Years Ago	
06/23/2015	PATHOLOGY SUREPATH PAP REQUEST

EMR 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)

Recommendations: Test Formulary

Review

all sendout
testing
performed
in 1 year

Eliminate

test listing in
menu if
ordered <4
times in 1 year

Review

remaining
tests on
menu to see
if reasonable



Topics Covered

Length of Stay

Transitions of Care

Denial of Payment

Readmissions

Hospital-Acquired Conditions

A blurred background image of a laboratory setting. In the foreground, a pipette is visible, and in the background, there are several test tubes and laboratory equipment. The overall color palette is light blue and white.

Denial of Payment

Sepsis DRG

Find & compare nursing homes, hospitals & other providers near you.

[Learn more about the types of providers listed here](#)

Sepsis care

Sepsis is a complication that occurs when your body has an extreme response to an infection. It causes damage to organs in the body and can... [Read more](#)

Percentage of patients who received appropriate care for severe sepsis and septic shock

↑ Higher percentages are better

48% ²

of 75 patients

National average: 60%

<https://www.medicare.gov/care-compare/>

Severe Sepsis and Septic Shock: Management Bundle (Composite Measure)

NQF ENDORSEMENT STATUS: Endorsed | NQF ID: 0500 | MEASURE TYPE: Process | INFO AS OF: Not available | CMIT ID: 1017 | REVISION: 1

This measure focuses on adults 18 years and older with a diagnosis of severe sepsis or septic shock. Consistent with Surviving Sepsis Campaign guidelines, **the measure contains several elements, including measurement of lactate**, obtaining blood cultures, administering broad spectrum antibiotics, fluid resuscitation, vasopressor administration, reassessment of volume status and tissue perfusion, **and repeat lactate measurement**. As reflected in the data elements and their definitions, these elements should be performed in the early management of severe sepsis and septic shock.

https://cmit.cms.gov/CMIT_public/ViewMeasure?MeasureId=1017



DRG: 871, \$10,621.61

A41.9 *Sepsis, unspecified organism*

J11.08

J45.901CC

E87.2CC

J15.1

R09.02

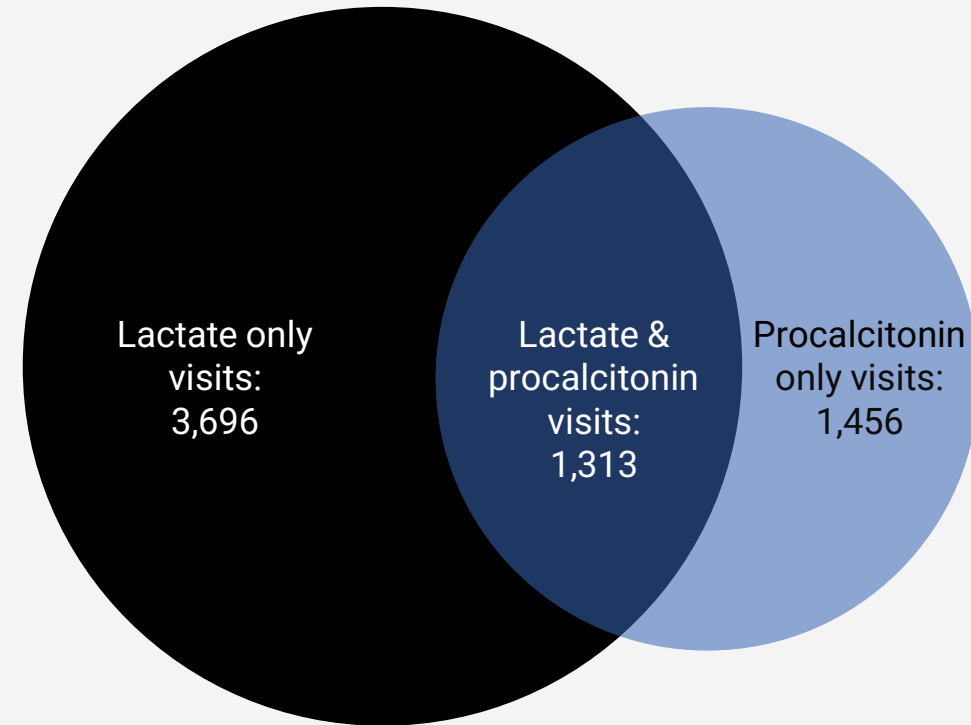
J42

<https://www.aapc.com/blog/31689-sepsis-and-sirs-in-icd-10-cm/>



DRG: 871, \$10,621.61
A41.9 Sepsis, unspecified organism

\$15,465,000



<https://www.aapc.com/blog/31689-sepsis-and-sirs-in-icd-10-cm/>

Recommendations

LIS/data
warehouse
reports

Audit sepsis
denials

Physician
queries/clinical
documentation
integrity (CDI)



Topics Covered

Length of Stay

Transitions of Care

Denial of Payment

Readmissions

Hospital-Acquired Conditions



Readmissions

Pharmacogenetics

Login

Find & compare nursing homes,
hospitals & other providers near you.

[Learn more about the types of providers listed here](#)

Unplanned hospital visits

Heart attack

Rate of readmission for heart attack patients

17.2%

No different than the national
rate

National result: 16.1%

Number of included patients: 128

<https://www.medicare.gov/care-compare/>

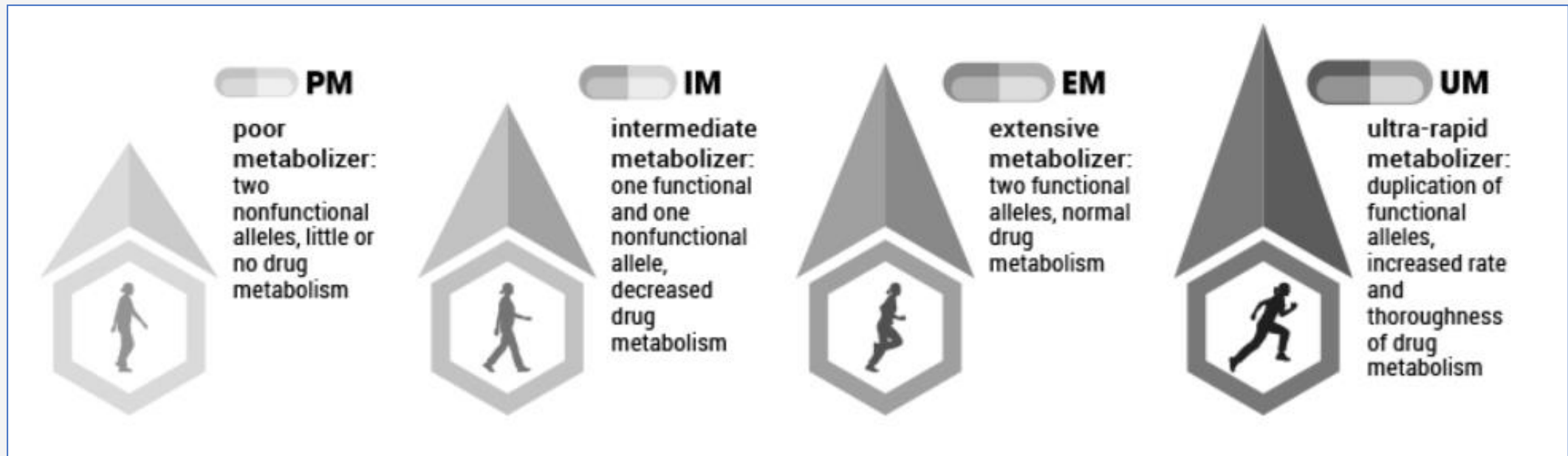
Pharmacogenomics: the study of how genes affect a person's response to drugs

- More than 85% of patients have significant genetic variation in the cytochrome P450 (CYP450) genes that metabolize the majority of the most commonly prescribed medications.

<https://www.sciencedirect.com/science/article/pii/S0163725813000065?via%3Dihub>

Coagulation

- Clopidogrel (Plavix)
- CYP2C19



CYP2C19

- Example: 5,000 patients discharged on Plavix without CYP2C19 testing
 - 30% no CYP2C19 expression
 - 10% weak CYP2C19 expression
 - 40% of total patients on ineffective antiplatelet agent
 - $5,000 \times 0.4 = 2,000$ patients at risk

Acute Coronary Syndrome Order Set

Medications

Platelet Inhibitors: Salicylates

- aspirin chewable tablet
- aspirin tablet

Platelet Inhibitors: P2Y12

- clopidogrel load and maintenance dose
 - clopidogrel (PLAVIX) tablet
 - clopidogrel (PLAVIX) tablet 75 mg
- prasugrel (EFFIENT) tablet
- ticagrelor (BRILINTA) tablet

Anti-ulcer Agents

- ranitidine (ZANTAC) tablet
- omeprazole (PRLOSEC) capsule
- pantoprazole (PROTONIX) injection 40 mg

No orders for CYP2C19

[Download this table \(CSV\)](#) - Last modified: Jun 12, 2020

# (N=377)	GENE (UNIQUE = 127)	DRUG (UNIQUE = 240)	GUIDELINE	CPIC LEVEL	PHARMGKB LEVEL OF EVIDENCE	PGX ON FDA LABEL	CPIC PUBLICATIONS (PMID)
1	HLA-B	abacavir	Guideline	A	1A	Testing required	<ul style="list-style-type: none"> • 24561393 • 22378157
2	HLA-B	allopurinol	Guideline	A	1A		<ul style="list-style-type: none"> • 23232549 • 26094938
3	CYP2D6	amitriptyline	Guideline	A	1A	Actionable PGx	<ul style="list-style-type: none"> • 23486447 • 27997040
4	CYP2C19	amitriptyline	Guideline	A	1A		<ul style="list-style-type: none"> • 23486447 • 27997040
5	UGT1A1	atazanavir	Guideline	A	1A		<ul style="list-style-type: none"> • 26417955
6	CYP2D6	atomoxetine	Guideline	A	1A	Actionable PGx	<ul style="list-style-type: none"> • 30801677
7	TPMT	azathioprine	Guideline	A	1A	Testing recommended	<ul style="list-style-type: none"> • 21270794 • 23422873 • 30447069



<https://cpicpgx.org/genes-drugs/>



Topics Covered

Length of Stay

Transitions of Care

Denial of Payment

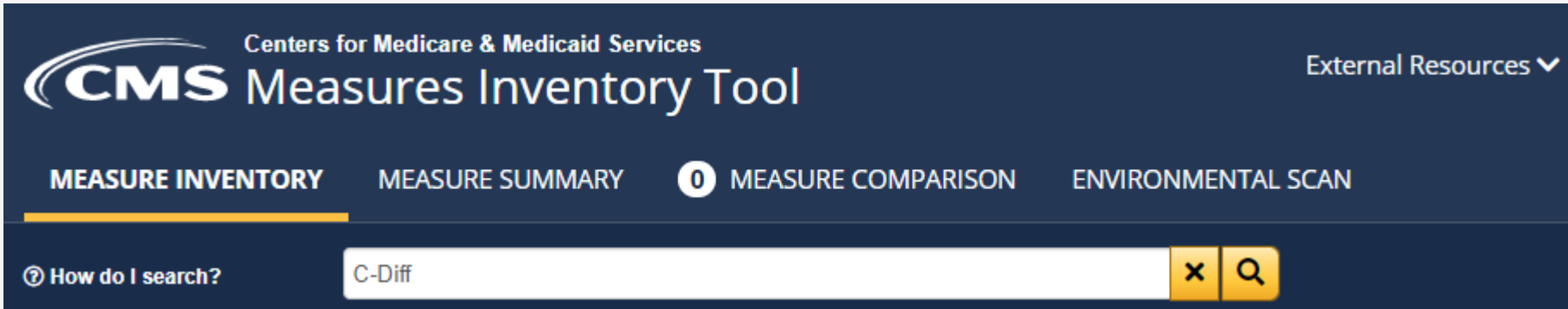
Readmissions

Hospital-Acquired Conditions



Hospital-Acquired Conditions

C-Diff, CAUTIs, MRSA



Total number of observed hospital-onset CDI
LabID events among all inpatients in the facility,
excluding well-baby nurseries and NICUs

https://cmit.cms.gov/CMIT_public/ViewMeasure?MeasureId=831

Login

Find & compare nursing homes, hospitals & other providers near you.

[Learn more about the types of providers listed here](#)

Complications & deaths

Infections

**Catheter-associated urinary tract infections (CAUTI) in ICUs and
select wards**

↓ *Lower numbers are better*

2.417

Worse than the national
benchmark

National benchmark: 1.000

<https://www.medicare.gov/care-compare/>

How Safe is Your Hospital?

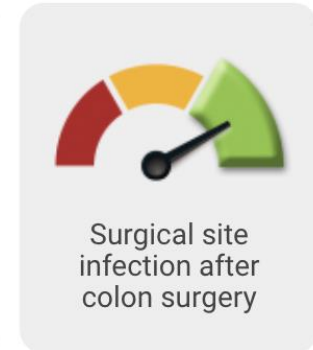
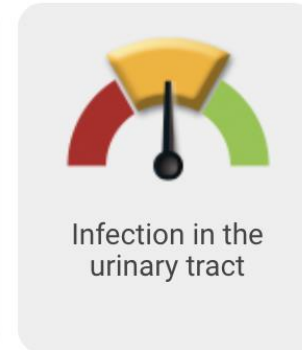
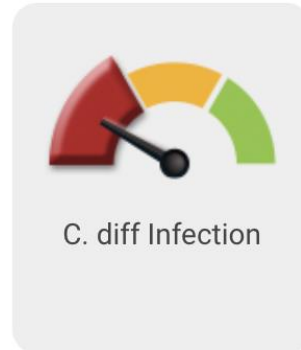
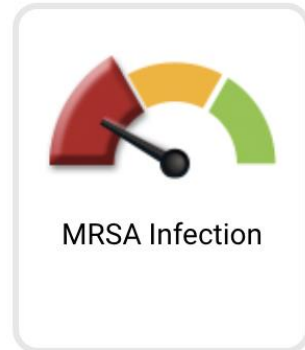
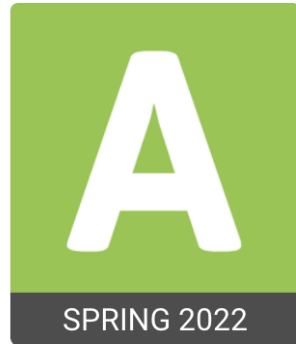
Search By City/State
Hospital Search Form

City

- Choose -

Search

This Hospital's Grade



<https://www.hospitalsafetygrade.org/state-rankings>



Topics Covered

Length of Stay

Transitions of Care

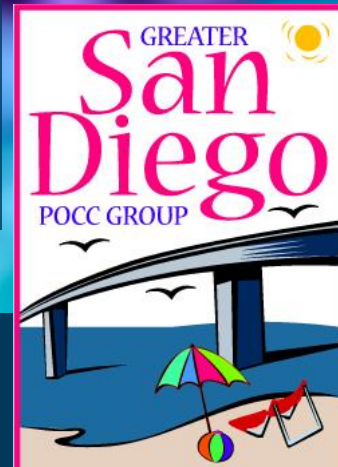
Denial of Payment

Readmissions

Hospital-Acquired Conditions

Learning Objectives

- Identify and discuss potential laboratory strategies to address length of stay issues
- Describe how laboratory tests can impact transitions of care and readmissions
- Demonstrate how laboratory tests can influence denials in payment due to medical necessity
- Discuss how laboratory testing can improve hospital acquired conditions



Demonstrating the Value of the Laboratory Partnerships with Case Management

Andrew Fletcher, MD, MBA, CPE, CHCQM, FCAP