COMPLIMENTARY WEBINAR

Collaboration in Extending Respiratory Testing to the Emergency Department

Thursday, May 11, 2023
1:00 PM – 2:00 PM ET

W. Frank Peacock, MD, FACEP, FACC, FESC

Professor,
Emergency Medicine
Vice Chair for Research

Baylor College of Medicine
Houston, Texas

Kimberly Evans, RN

Emergency Department
Unit Supervisor

University of South Alabama
Children's and Women's Hospital
Mobile, Alabama

MODERATOR

Ian Reilly, MD, FACEP

Emergency Physician

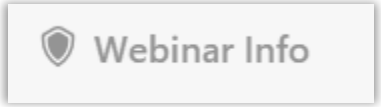
Scripps Memorial Hospital
La Jolla
La Jolla, California

The speakers are presenting on behalf of Abbott.
The information presented is consistent with applicable FDA guidelines.
This program does not provide continuing medical education (CME) credits.

Sponsored by

Abbott

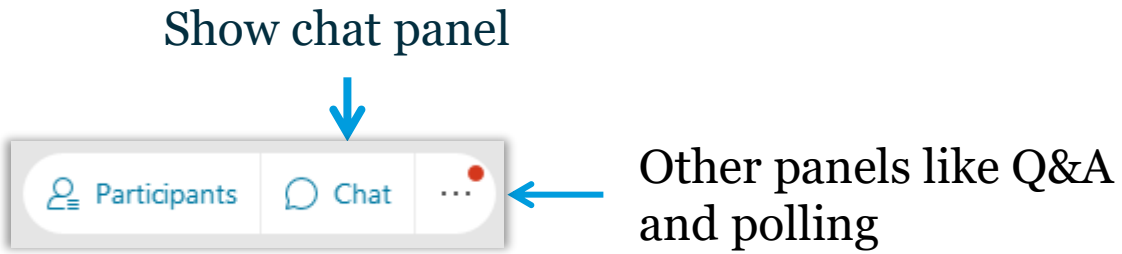
Joining the Teleconference



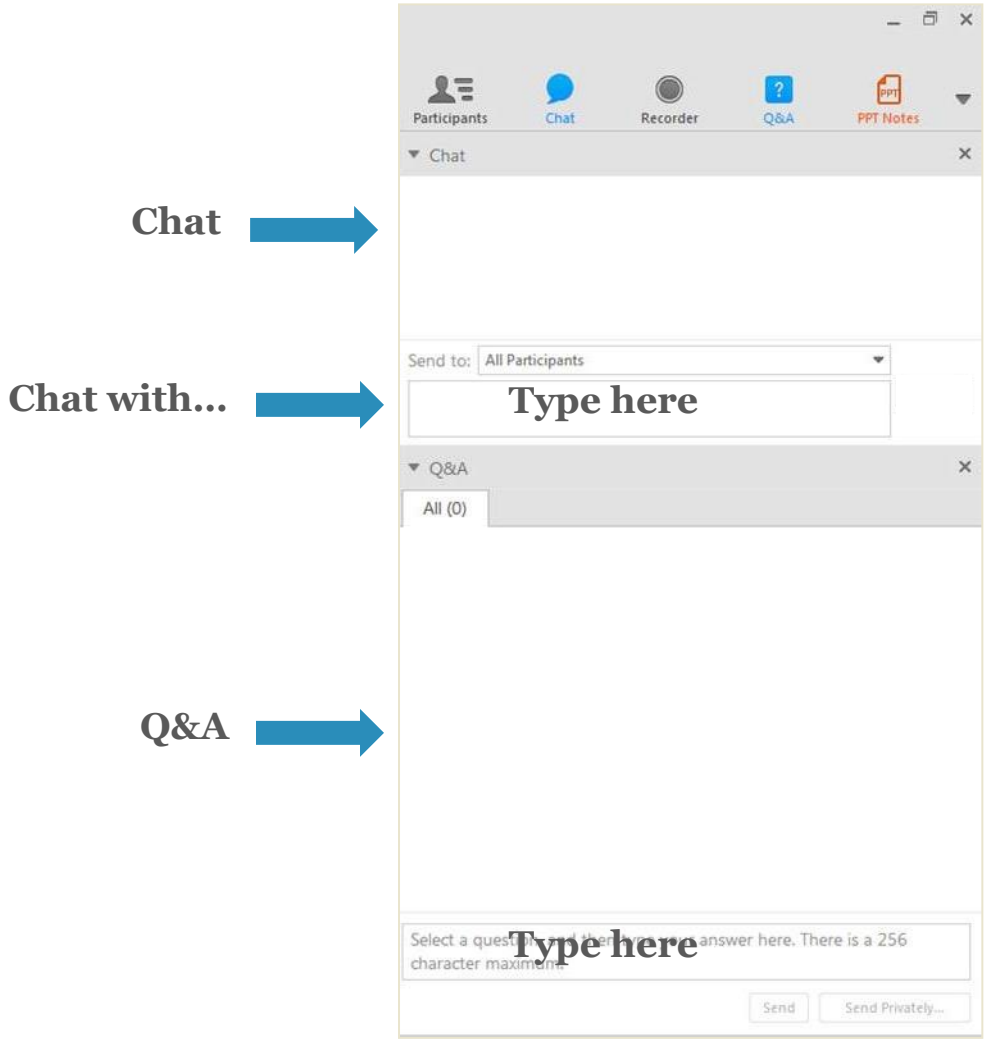
If you closed the ‘Phone’ call in box when you joined:

- Click on the Webinar Info tab for Dial-in information (top left of your screen)

Chat and Q&A


Show chat panel
Participants
Chat
Other panels like Q&A and polling

Chat and Q&A


Chat
Chat with…
Q&A
Participants
Chat
Recorder
Q&A
PPT Notes
Chat
Send to:
All Participants
Type here
Q&A
All (0)
Type here
Send
Send Privately…

Available CE Credit

P.A.C.E.®

Florida laboratory CE

Certificate of Attendance

To Receive Certificate of Attendance

After today's webinar:

- A certificate of attendance available for all attendees
- Evaluation form will appear automatically
- Must complete Eval to receive Certificate link via email
- **For groups: Those logged in will receive Email from messenger@webex.com with link to evaluation. Forward email to colleagues who attended with you!!!**
- Double-check email address

Joined Using a Mobile Device?

- Evaluation won't appear automatically, but…
- Watch for email with link to evaluation!

Recording

Within a few days following today's event, visit

https://www.whitehatcom.com/abbott

Collaboration in Extending Respiratory Testing to the Emergency Department

Live Event: Thursday, May 11, 2023 | 1:00 - 2:00 PM Eastern Time
P.A.C.E.® credit available until May 11, 2024
Florida Laboratory CE Credit available

RECORDING

SLIDES

Please join this session for an insider's view of respiratory testing in the Emergency Department (ED). Experts from the ED will share real-world experience with clinical and operational examples of patients presenting with symptoms related to respiratory illness. Our speakers will also discuss strategies for influencing and implementing rapid testing at the point of care for respiratory infectious diseases, such as COVID-19, Influenza, RSV, and Group A Strep.

The webinar will:

- Describe apparent (and less apparent) factors that affect care in the ED
- Analyze the role of timely diagnostic test results on patients, ED staff, and the healthcare system
- Examine approaches and evidence for delivering results to decrease time to targeted patient care and infection control decisions
- Assess strategies where ED influence and laboratory collaboration helped facilitate the implementation of POC testing

Presenters:

Kimberly Evans, RN

Emergency Room Nurse
University of South Alabama Children's and Women's Hospital
Mobile, AL

Frank Peacock, IV, MD, FACEP, FACC, FESC

Professor of Emergency Medicine
Emergency Medicine Vice Chair for Research
Baylor College of Medicine
Houston, TX

Moderator:

MODERATOR

Ian Reilly, MD, FACEP

Emergency Physician

Scripps Memorial Hospital La Jolla

Objectives

- Describe apparent (and less apparent) factors that affect care in the Emergency Department (ED)
- Analyze the role of timely diagnostic test results on patients, ED staff, and the healthcare system
- Examine approaches and evidence for delivering results in time for targeted patient care and infection control decisions
- Assess strategies where ED influence and laboratory collaboration helped facilitate the implementation of POC testing

W. Frank Peacock IV
MD, FACEP, FACC, FESC

Professor, Emergency Medicine
Vice Chair for Research

Baylor College of Medicine

Saving Lives: Respiratory Point of Care Testing in the Emergency Department

May 11, 2023, 13-14:00 EST

W. Frank Peacock, MD, FACEP, FACC, FESC
Vice Chair of Research, Baylor College of Medicine
President, Comprehensive Research Associates, LLC

W. F. Peacock, MD, FACEP, FACC, FESC Disclosures

Research Grants:

Brainbox, Quidel

Consultant:

Abbott, Brainbox, Instrument Labs, Janssen, Osler, Roche, Siemens, Spinchip, Vifor

Stock/Ownership Interests:

AseptiScope Inc, Brainbox Inc, Braincheck Inc, Coagulo Inc, Comprehensive Research Associates LLC, Comprehensive Research Management Inc, Emergencies in Medicine LLC, Fast Inc, Forrest Devices, Ischemia DX LLC, Lucia Inc, Prevencio Inc, RCE Technologies, ROMTech, ScPharma, Trivirum Inc, Upstream Inc.

Is an hour important?

Some may say
it is not……..

Is an hour important?

BMJ

RESEARCH

Association between waiting times and short term mortality and hospital admission after departure from emergency department: population based cohort study from Ontario, Canada

Astrid Guttmann, senior scientist,[1,2,3,4] Michael J Schull, senior scientist and 2010-11 Commonwealth Fund Harkness fellow,[1,4,5,6,7] Marian J Vermeulen, epidemiologist,[1,6] Therese A Stukel, senior scientist[1,4,6]

N = 13,934,542

Adverse events increase with mean LOS in similar patients in the same ED shift

OR for Death if LOS ≥6 v <1 hr cohorts

- Hi Acuity 1.79 Low Acuity 1.71

BMJ 2011; 342:d2983.

Is an hour important?

The association between hospital overcrowding and mortality among patients admitted via Western Australian emergency departments

Peter C Sprivulis, Julie-Ann Da Silva, Ian G Jacobs, Amanda RL Frazer and George A Jelinek

N= 62,495

Risk ratio for DEATH

- Per hour of ED stay = 1.1 ($p < 0.001$)
- Per hour of ED wait = 1.2 ($p=0.01$)

MJA 2006; 184: 208–212.

Is an hour important?

HEALTH POLICY AND CLINICAL PRACTICE/ORIGINAL RESEARCH

Prolonged Emergency Department Stays of Non–ST-Segment-Elevation Myocardial Infarction Patients Are Associated With Worse Adherence to the American College of Cardiology/American Heart Association Guidelines for Management and Increased Adverse Events

Deborah B. Diercks, MD
Matthew T. Roe, MD, MHS
Anita Y. Chen, MS
W. Franklin Peacock, MD
J. Douglas Kirk, MD
Charles V. Pollack, Jr., MD, MA
W. Brian Gibler, MD
Sidney C. Smith, Jr., MDE
Magnus Ohman, MD
Eric D. Peterson, MD, MPH

From the University of California, Davis, School of Medicine, Sacramento, CA (Diercks, Kirk); the Division of Cardiology and Duke Clinical Research Institute, Duke University Medical Center, Durham, NC (Roe, Chen, Ohman, Peterson); the Cleveland Clinic Foundation, Cleveland, OH (Peacock); the Pennsylvania Hospital, Philadelphia, PA (Pollack); the University of Cincinnati School of Medicine, Cincinnati, OH (Gibler); and the Department of Cardiology, University of North Carolina, Chapel Hill, NC (Smith).

N=42,780

Long ED stays less often received guideline-recommended NSTEMI therapies

Ann Emerg Med. 2007; 50; 489-96.

Is an hour important?

The Impact of Emergency Department Crowding Measures on Time to Antibiotics for Patients With Community-Acquired Pneumonia

Jesse M. Pines, MD, MBA, MSCE
A. Russell Localio, PhD
Judd E. Hollander, MD
William G. Baxt, MD
Hoi Lee, MD
Carolyn Phillips, MD
Joshua P. Metlay, MD, PhD

From the Department of Emergency Medicine (Pines, Hollander, Baxt, Lee, Phillips) and Center for Clinical Epidemiology and Biostatistics (Pines, Localio, Metlay), University of Pennsylvania School of Medicine, Philadelphia, PA; the Department of Medicine (Metlay), Leonard Davis Institute of Health Economics (Pines), University of Pennsylvania, Philadelphia, PA; and the Center for Health Equity Research and Promotion, VA Medical Center, Philadelphia, PA (Metlay).

N=694 patients Delayed/No antibiotics

- OR 1.05 for each additional WR patient
- OR 1.14 for each additional WR hour

Ann Emerg Med. 2007;50:510-516.

Is an hour important?

HEALTH POLICY AND CLINICAL PRACTICE/ORIGINAL RESEARCH

Emergency Department Crowding Is Associated With Poor Care for Patients With Severe Pain

Jesse M. Pines, MD, MBA, MSCE
Judd E. Hollander, MD

From the Department of Emergency Medicine (Pines, Hollander), the Center for Clinical Epidemiology and Biostatistics (Pines), University of Pennsylvania School of Medicine, and the Leonard Davis Institute for Health Economics, University of Pennsylvania, Philadelphia, PA.

N=13,758

Non-treatment of pain associated with waiting room number

OR = 1.03 for each additional waiting patient

Ann Emerg Med. 2008;51:1-5.

Is an hour important?

A Pilot Study Examining Undesirable Events Among Emergency Department–Boarded Patients Awaiting Inpatient Beds

Shan W. Liu, MD, MPH
Stephen H. Thomas, MD, MPH
James A. Gordon, MD, MPA
Azita G. Hamedani, MD, MPH
Joel S. Weissman, PhD

From the Department of Surgery (Liu, Thomas) and Department of Medicine (Gordon), Harvard Medical School, Boston, MA; the Department of Emergency Services, Massachusetts General Hospital, Boston, MA (Liu, Thomas, Gordon); the Division of Emergency Medicine, Department of Medicine, University of Wisconsin School of Medicine and Public Health, Madison, WI (Hamedani); and the Department of Family and Community Medicine, University of Massachusetts, Boston, MA (Weissman).

N=162 “boarded” patients (waiting for room)

Undesirable event

Missed meds, lab results, arrhythmias, or other adverse events

27.8% had an undesirable event

Ann Emerg Med. 2009;54:381-385.

Crowding and Death within 7 Days

- 2,146,605 people over 7 years (1st ED visit)
- Model to predict mortality based on:
  - Age, urgency, hospital, year, season, day of week, deprivation, ethnicity, degree of crowding at time of arrival
- **PURPOSE**: To see if coming to ED when it was crowded changed your risk of death

Jones PG, van der Werf B. Emerg Med Australas. 2021 Aug;33(4):655-664.

Outcomes:

- Changes in death risk based on ED arrival events
- Death ↑
  - 6% if not meeting triage time targets
  - 7% if >90% not meeting a 4 hr ED LOS target
  - 10% if ≥10% of patients have Access Block
    - Access Block = admitted with ED LOS >8 h
- Death ↓
  - 9% if ED occupancy is <100%

Jones PG, van der Werf B. Emerg Med Australas. 2021 Aug;33(4):655-664.

16,201,036 patients

YES,
AN HOUR
IS IMPORTANT

What business intentionally kills its customers?

If you had a way of getting data quickly, wouldn't you?

Source: Yale University Library

FASTER IS IMPORTANT

What's the future look like?

Image, W.F. Peacock

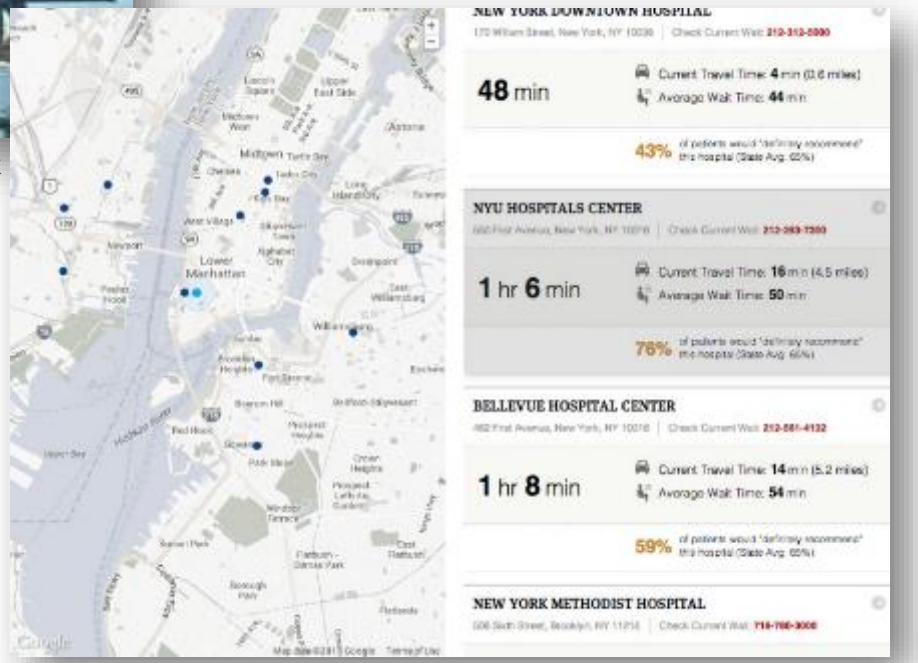


Image WF Peacock: ER Inspector

How long would you wait for… ??

ER Insights

Vernacular

LWOBS

Elope

AMA

What to do?

Admit?
Absolutely no help.

Discharge?

Fixes the problem

2006 Press Ganey

1.5 million ER patients, >1,500 US hospitals

Mean ED LOS = 4h

- LOS ↑ for all states, except Hawaii
- ED LOS increases 30 minutes for each 10,000 ↑ vol
- Patient satisfaction

  Lowest 3:00-11:00 p.m. (busiest ED time)

  Highest 7:00 AM – 3:00 p.m.

Patient satisfaction a direct function of ED LOS

89.3 if < 1 hour

77.7 if > 4 hours

ED Pulse Report 2007. Press Ganey Associates, Inc.

2006 Press Ganey

1.5 million ER patients, >1,500 US hospitals

Mean E

- LOS
- ED
- Pati

  L

  Highest 7:00 AM – 3:00 p.m.

22.3% Hated their ER Experience!!!

Patient satisfaction a direct function of ED LOS

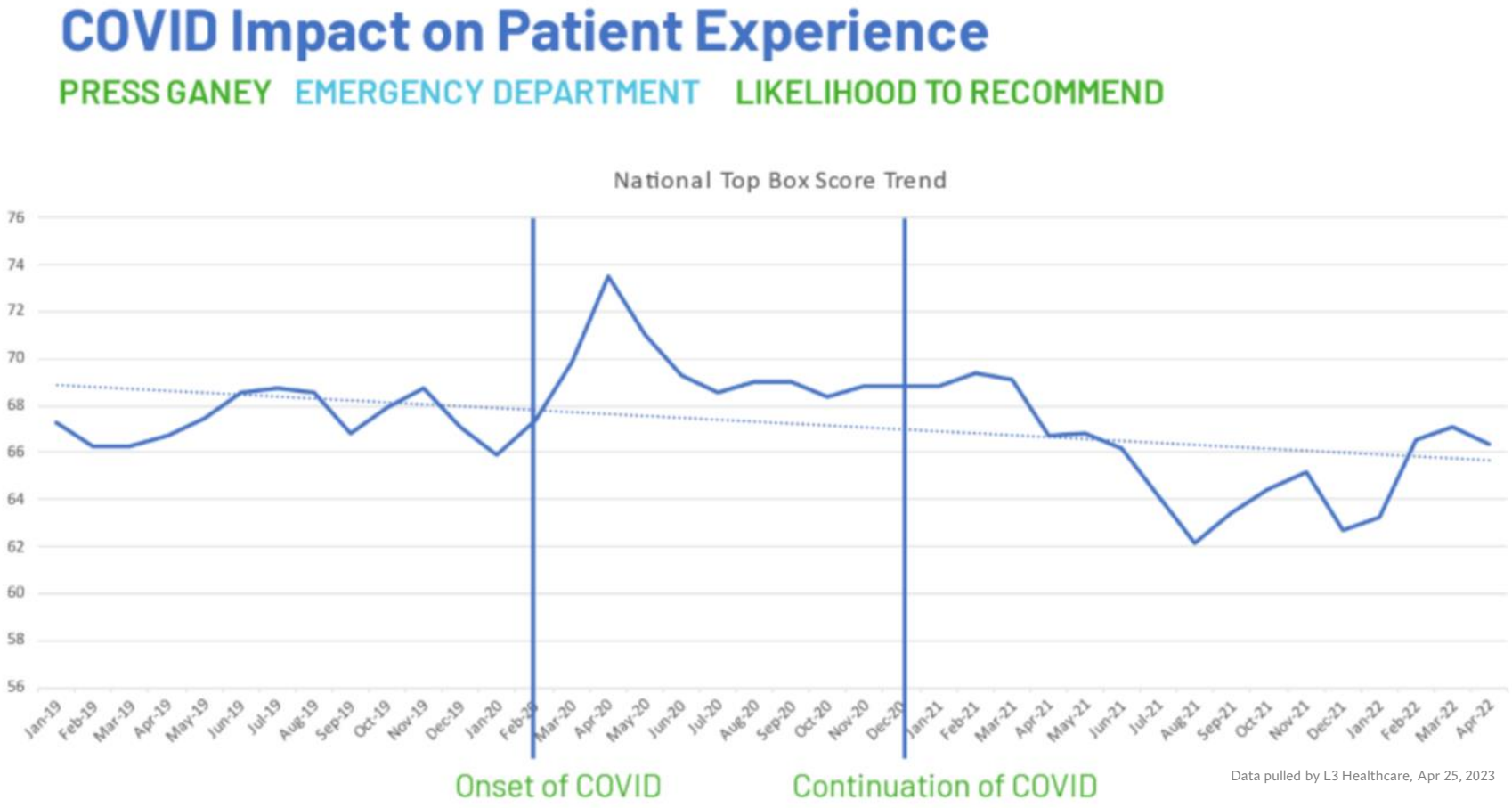
89.3 if < 1 hour

77.7 if > 4 hours

ED Pulse Report 2007. Press Ganey Associates, Inc.

2022 Press Ganey

National patient experience data reveals **unprecedented drops in ED patient experience**



https://info.pressganey.com/press-ganey-blog-healthcare-experience-insights/us-emergency-departments-seeing-unprecedented-decreases-in-patient-experience

Financial Impact of ER crowding

How Frank got POCT in his ER

32 beds

- 18 critical care – Most get marker testing
- 14 fast track – Rare marker testing

LOS ~4 hours = can handle 152 pts/day

Decrease to LOS ~3 hours = can handle 228 pts/day

An additional 76 pts/day

- @ mean billing of $2,000/pt = ↑ in gross billables $102K/day
- If only an extra 30 pts/day (40% of 76) = $60K/day
- If only 30% (n=10) of these get marker testing = $20K/day
- If only 50% (n=5) of these discharged 1 hour earlier = $10K/day
- If collection rate is 30% = $3K/day……. **~$1.1Mn/yr**

What is POINT OF CARE?

FAST
- Turn around time (TAT)
- Door to Brain

SMALL
- Handheld or Compact

EASY
- For Nurse
- For Tech
- No centrifuge
- No pipette

POC IS NOT
- Cheap
- Inaccurate

POC → Central Lab

Door to Brain Time

- **Prospectively collected Tn TAT data during all ED shifts**
- **From patient ED arrival until Emergency Physician aware of result**

Peacock WF et al. Acad Emerg Med. 2004;11(5):569–570. (abstract)

Credit: W. Frank Peacock

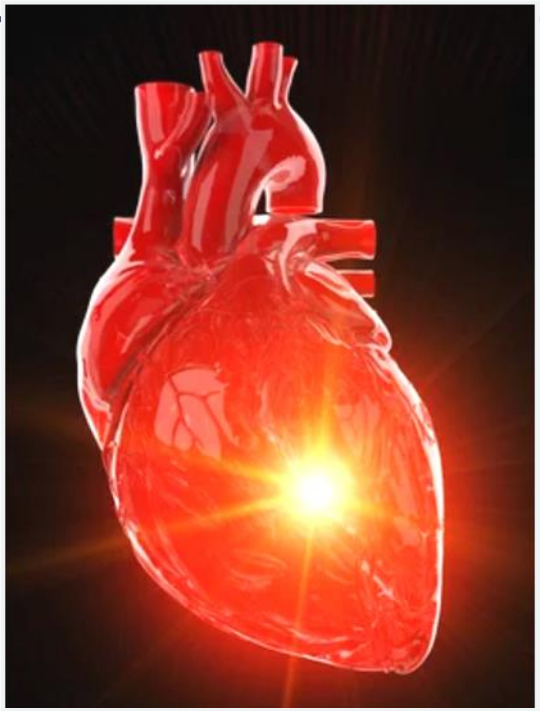
Direct correlation between better guideline adherence and fewer adverse outcomes

Peterson ED et al. JACC. 2003;41:53A. (abstract)

Results

25 participating hospitals

N= 1,360 patients



Overall

Mean DTBT 115.7 ± 70.1 minutes

Median 100; IQR = 73,138

Central lab

Mean DTBT 119.2 ± 70.5 minutes

Median 103; IQR = 76,141

Point of Care

Mean DTBT 68.2 ± 40.8 minutes

Median 62.5, IQR = 43,83.5

Saves about 1 hour

DTBT, door to brain time

Peacock WF et al. Acad Emerg Med. 2004;11(5):569–570. (abstract)

The Use of a Quantitative POC System Greatly Reduces the Turnaround Time of Cardiac Marker Determination

Gaze D, Collinson PO, Haass M, Derhaschnig U, Hirschl MM, Katus HA, et al.
for the CARMYT Multicentre Study Group

- **5 hospitals**
- **4609 Tn T POC samples**
  - **3447 split and sent to lab for CKMB**

Gaze D et al. for the CARMYT Multicentre Study Group. *Point of Care: The Journal of Near-Patient Testing & Technology*. 2004;3:156–158.

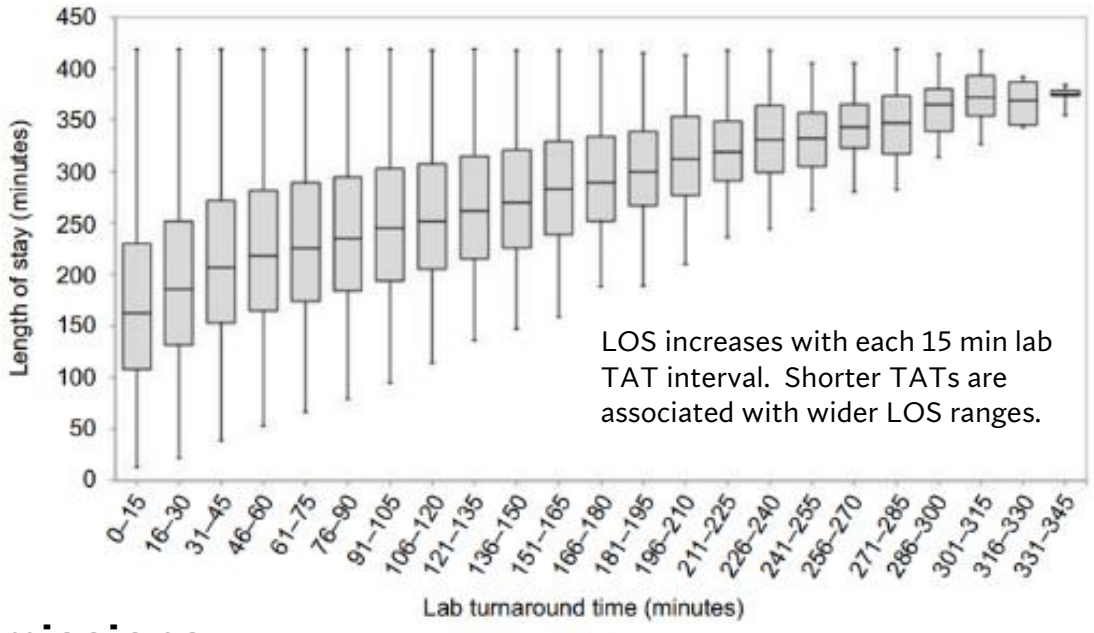
Locale	Hosp Type	Transp	POC TnT	CK CKMB	Diff (mins)
ED	Univ	Pneumo tube	21 ±0.2 (n=1879)	107±2.3 (n=1744)	86±2.3
ED	Univ	Courier	22±0.5 (n=855)	72±1.7 (n=689)	50±1.5
CCU	Rural	Nurses	12±0.5 (n=471)	147±64.1 (n=150)	135±64.1
ED	Muni	Pneumo tube	22±0.8 (n=706)	90±0.5 (n=185)	68±1.1
ED	Univ	Pneumo tube	18±0.5 (n=698)	52±1.4 (n=679)	34±1.4
All			**20±0.2 (n=4609)**	**85±1.5 (n=3447)**	**65±1.5**

Gaze D et al. for the CARMYT Multicentre Study Group. *Point of Care: The Journal of Near-Patient Testing & Technology*. 2004;3:156–158.

POC saves 1 hour in the ER

Reduction in lab TAT decreases ER LOS

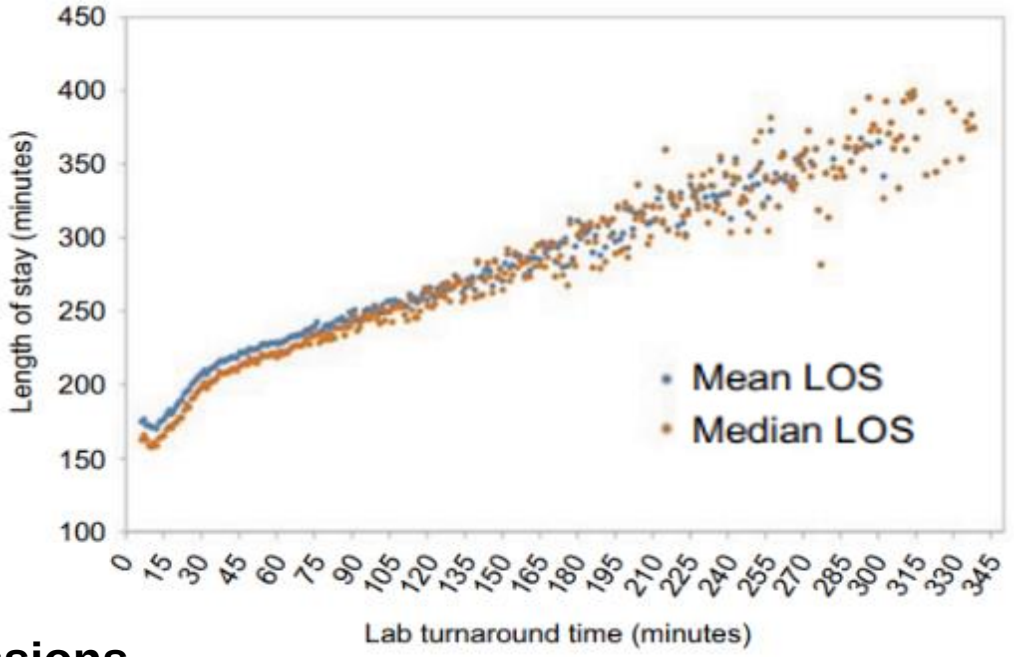
- Retrospective multivariate analysis
- Single and multisite ED EHR encounters at a tertiary hospital
- Multisite analysis:
  - **4,483,169** ED visits
  - **1-minute decrease in lab TAT, associated with 0.5 minute of decrease in LOS**
  - Consistent for all patient acuities
- Single-site analysis, Beth Israel Deaconess Medical Center ED
  - **52,080** visits on **36,570** unique patients:
  - **A 5-, 10- and 15-minute TAT reduction allowed an increase of 127, 256 and 386 additional annual admissions.**



Kaushik N. Open Access Emerg Med. 2018 Apr 20;10:37-45.

Reduction in lab TAT decreases ER LOS

- Retrospective multivariate analysis
- Single and multisite ED EHR encounters at a tertiary hospital
- Multisite analysis:
  - **4,483,169** ED visits
  - **1-minute decrease in lab TAT, associated with 0.5 minute of decrease in LOS**
  - Consistent for all patient acuities
- Single-site analysis, Beth Israel Deaconess Medical Center ED
  - **52,080** visits on **36,570** unique patients:
  - **A 5-, 10- and 15-minute TAT reduction allowed an increase of 127, 256 and 386 additional annual admissions.**



Kaushik N. Open Access Emerg Med. 2018 Apr 20;10:37-45.

Quality and Patient Satisfaction

If you aren't increasing efficiency and quality…

…there are penalties:

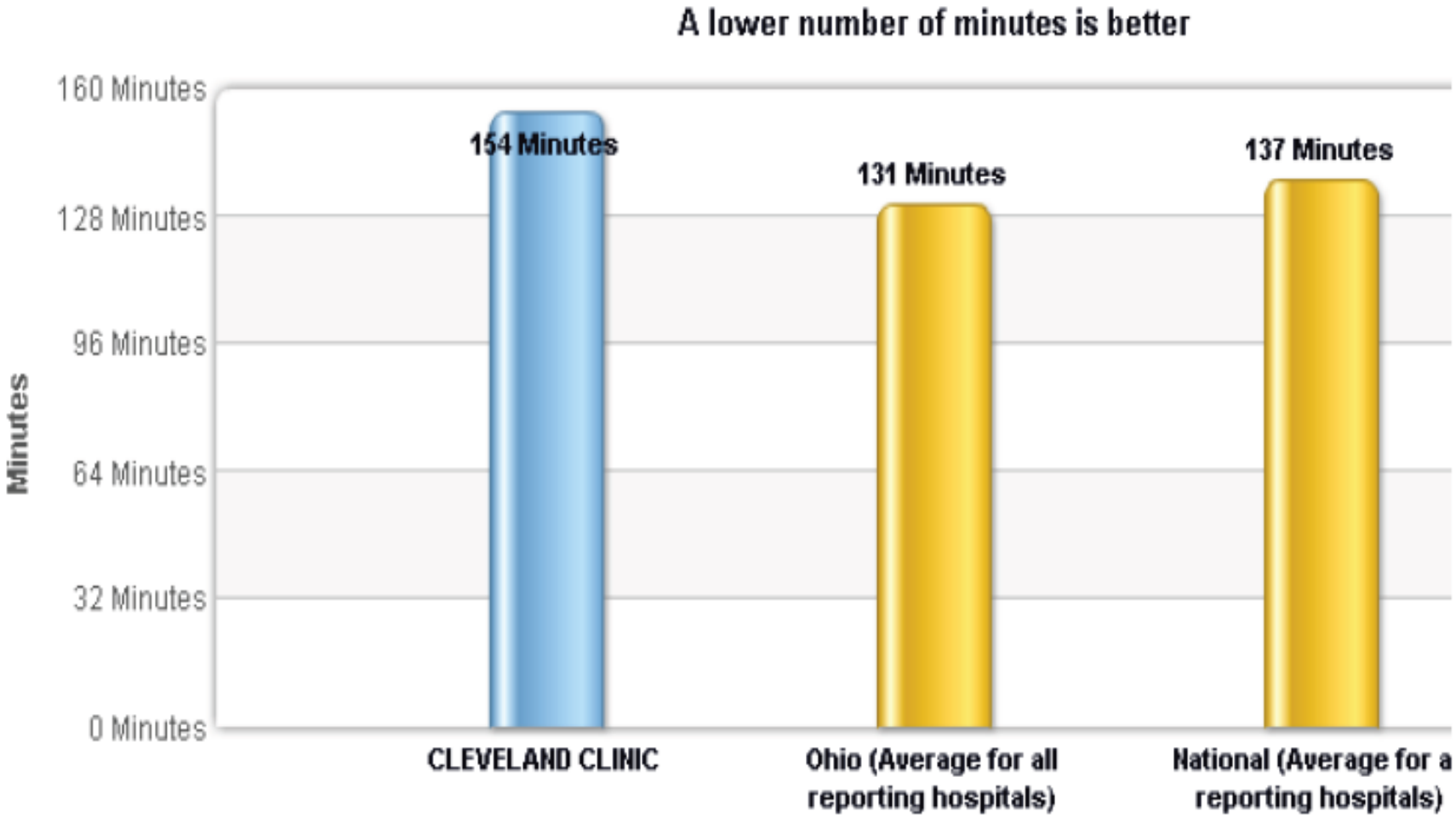
1/3 - Patient Satisfaction

2/3 - Quality measures

Value-based purchasing (VBP) program reductions:
FY 2013: 1.0%
FY 2014: 1.25%
FY 2015: 1.5%
FY 2016: 1.75%
FY 2017/subsequent years: 2.0%

Data.CMS.gov. Linking quality to payment. https://data.cms.gov/provider-data/topics/hospitals/linking-quality-to-payment

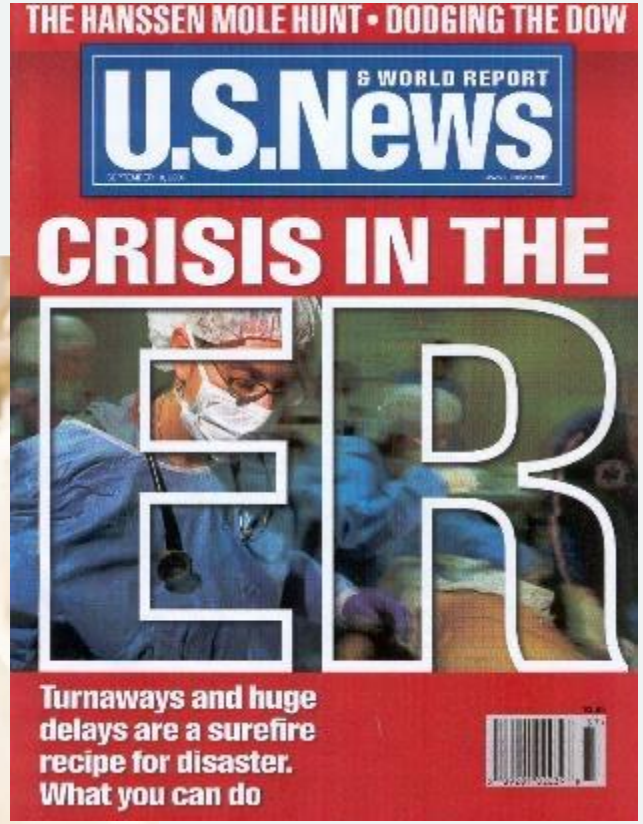
Average time patients spent in the emergency department before being sent home



http://www.medicare.gov/hospitalcompare, accessed in 2010

Got a daughter?

Sunday in the ER



U.S. News & World Report, cover story. Sept 10, 2001.

Impact of Fast SARS-CoV-2 Molecular POCT on LOS in an ED

Saint-Louis Hospital, Paris, France

Adult patients, needing rapid diagnosis of SARS-CoV-2

Period 1) N=337 10/16 - 11/3, 2020
Lab-based NAAT (Cepheid Xpert® Xpress SARS-CoV-2) or
Lab-based respiratory panel (Biofire FilmArray® RP2) **in virology lab**

Period 2) N=339 11/4 to 11/30, 2020
POC NAAT (Abbott ID NOW™) **in ED**

POC NAAT (Period 2)

- **More patients spent less time (<4 h) in the ED**, 61.3% vs 38.3%, $p < 0.0001$
- **Shorter ED LOS**, median 208 vs 276 min, $p < 0.0001$
  - Univariate analysis factors: HTN, anosmia/ageusia, number of pts/day, rapid NAAT in the ED
  - By multivariate analysis, period of testing remained significantly associated with ED LOS

Rapid POCT SARS-CoV-2 NAAT performed in ED associated with reduced ED LOS

Baron A. Microbiol Spectr. 2022 Aug 31;10(4):e0063622.

Outcomes of POC testing for Flu in the ED of a tertiary referral hospital in Ireland

- 7,150 lab records
- 2017-2020, 4 Flu seasons
- POC NAAT (ID NOW™) vs. Lab-based NAAT Flu A/B/RSV (GeneXpert®)

- POC NAAT Influenza A
  - Sensitivity = 90.6% (95% CI = 78.6-96.5)
  - Specificity = 99.2% (95% CI = 95.2-100)
- **POCT NAAT:**
  - **Reduced HAI, 51.4%** and **41.9%** (2 seasons using POCT)
  - **Admit rate ratio: 0.72** for Flu diagnosed by POCT (95% CI: 0.53-0.97), p = 0.031

Flu vs ??

Teoh TK. J Hosp Infect. 2021 Apr;110:45-51.

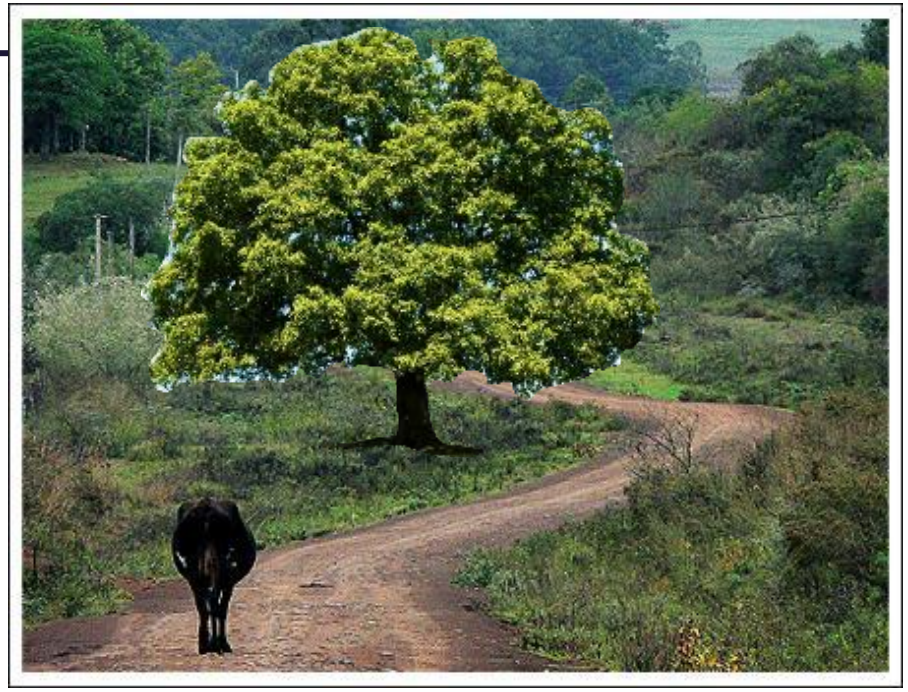
Paving cowpaths?

Prospective, ED ordered flu test

Test: CLIA waived flu POC NAAT
(Roche cobas® Liat®)

POCT (N = 100) vs lab test (N = 97)

Time to Disposition (TTD) = time of discharge order



[Photo credit: Gonzalo Viera Azpiroz]

POC NAAT

- **Shorter TAT:** median (IQR) 30.5 (7.5) vs 106.0 (55) mins, p = 0.001
- **More flu (+):** 51.0% vs. 33.0%, p = 0.01
- No change in Pt Antibiotic Rx: 14.0% vs 14.4%, p = 0.93
- No change in TTD: median (IQR) 146.5 (98.5) and 165.5 (127) mins, p = 0.26

POC flu test provided faster TAT than the lab, there was no difference in TTD or antibiotic use

Schechter-Perkins EM. Am J Emerg Med. 2019 May;37(5):873-878.

Impact of Rapid Molecular Respiratory Virus Testing on Real-Time Decision Making in a Pediatric ED

- Prospective cohort study
- Consecutive peds pts, 9 weeks, peak flu season
- ED ordered respiratory NAATs (from lab)
- ED Drs interviewed to discern plans if given immediate flu/RSV results

- **Drs would change management** in 39 (64%) of 61 ED-ordered tests
- Drs actions would have:
  - **Decreased ED LOS**, 33 mins
  - **Ordered fewer tests**, 18%, $p < 0.001$; mean **pt charge savings** of $669
  - **Ordered fewer antibiotics** among discharged patients, 17%, $p = 0.043$
  - **Increased appropriate antiviral use**, 13%, $p = 0.023$

Stanford University

Rogan DT. J Mol Diagn 2017 May;19(3):460-467.

Clinical and operational impact of POC SARS-CoV-2 detection in the ED

- Prospective, 'Before/After'
  - COVID-19 Rapid NAAT (Abbott ID NOW™)
  - Weeks 37 to 50, 2020
- N=3333 ED pts, 331 (9.9%) SARS-CoV-2 (+)
  - 136 (9.2%) before, 195 (10.5%) after POC

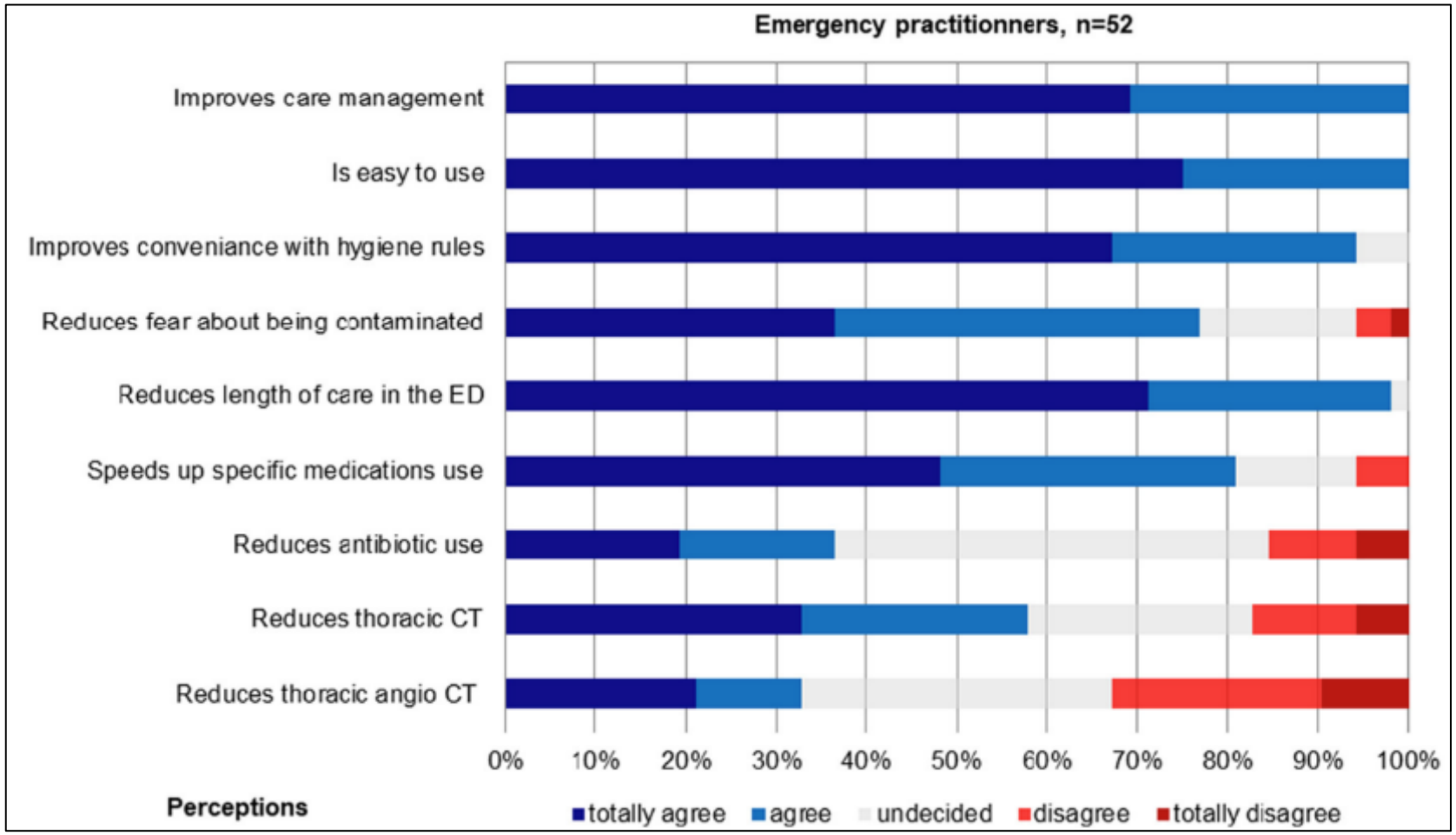
POC NAAT

- In-hospital mortality similar, 8.2 vs 9.5%
- **Hospitalizations higher**, 81.6% vs. 65.4%, p < 0.001
- **If (+), anticoagulants higher**, 40% vs. 24.2%, p < 0.003, antibx/steroids similar
- **More pts able to leave the ED within 6 h**

	Median (IQR) ED LOS (hrs)		P-value
	Before POC	**After POC**	
Overall	6.7 (4.6-9.2)	7.2 (4.4-9.5)	0.43
<3h, n (%)	**8 (5.6)**	**32 (16.4)**	**0.003**
3-6, n (%)	**50 (36.9)**	**39 (20)**	**0.0009**
6-12, n (%)	66 (48.5)	104 (53.3)	0.34
>12, n (%)	12 (8.8)	20 (10.2)	0.85

Gerlier C. Am J Emerg Med. 2021 Dec;50:713-718.

Clinical and operational impact of POC SARS-CoV-2 detection in the ED



Gerlier C. Am J Emerg Med. 2021 Dec;50:713-718.

Positive Impact of an ED POC Flu Test During the 2017–2018 Epidemic

- Retrospective, observational study, adults
- 1200-bed hospital, northeastern France
- 2017–2018 flu epidemic, when ran out of reagents for POC testing
- Only pts (+) flu test included
  - 451 POC NAAT: (+) 119 (26.4%) invalid 50 (11.1%) (-) 282 (62.5%)
  - 365 Lab-based NAAT: (+) 128 (35.1%) invalid 5 (1.3%) (-) 232 (63.6%)

- POC Flu NAAT
  - Similar Oseltamivir tx rate with lab-based NAAT
  - **Earlier tx with POC NAAT**; mean 9.5 vs 23.6 hrs
  - **Fewer antibiotics**, 38.9% vs 55.7%, p = 0.03
  - **Shorter ED LOS**, 10.2 vs 12.9 hrs, p = 0.005
  - **Lower hospitalization rate**, 38.9% vs 61.3%, p = 0.003

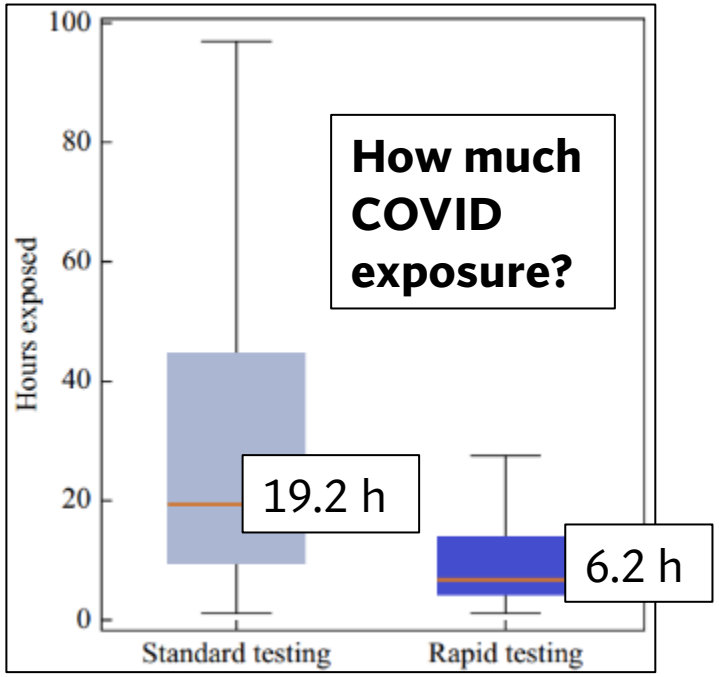
Martinot M. Open Forum Infect Dis. 2019 Jul 1;6(7):ofz312.

Large Reductions in Uninfected Pt Exposure

- Retrospective, Adults in ED, 2 Academic, 1 Suburban (Johns Hopkins Health System)
- 12,263 tested (excluded d/c'd pts; isolation independent result)
- 9,018 pts remained in hospital (ED or inpatient) until results available ("exposed cohort")
  - 3502 (38.8%) POC SARS-CoV-2 NAAT (Xpert Xpress), ~45 mins time to result
  - Remainder Lab-based SARS-CoV-2 NAAT
- 9.9% tested (+); most (60%) hospitalized

POC SARS-CoV-2 NAAT

- **Shorter Median (IQR) hours to result**
  1.9 (1.4 - 2.8) vs 7.8 (3.7 - 11.7), $p < 0.001$
- **Increased treatment capacity**
  3,028 more bed-hours per week
- **Fewer patient interactions requiring personal protective equipment**
  7,500 per week



J.S. Hinson et al. / Journal of Hospital Infection 107 (2021) 35-39.

POC NAAT for Flu A/B on an acute medical unit in a large UK teaching hospital

- POC Influenza A/B NAAT (Cepheid GeneXpert®) in Acute Medical Unit, 12/17 – 3/18
- Any pt with Flu-like illness vs same time 1-yr prior
- Outcomes measured

POC NAAT

- **Shorter LOS**: 2.4 vs 7.9 d
- **Shorter time to isolation**: 0.09 vs 1.26 d
- **Shorter time to antivirals**: 0.59 vs 1.1d
- **Confirmed flu: 51** before POC, **666** after POC
- **Fewer flu cases identified 72 h after admission**: 9% vs 51%

Garvey et al. Antimicrobial Resistance and Infection Control (2019) 8:120.

Implementation of Flu POCT and cohorting during a high-incidence season: the impact on infection prevention, control, and clinical outcomes

- ‘Before/After’ study
- N = 654 inpatients (223 before, 431 after) with confirmed flu

Influenza POC NAAT in ED and pt cohorting on a flu ward:

- **Fewer cases of hospital-acquired/nosocomial flu** per day, 0.66 vs 0.95, $p < 0.0001$
- **Shorter median LOS**, 5.5 vs 7.5 days, $p = 0.005$
- **More antiviral prescriptions**, 80% vs 64.1%, $p < 0.0001$
- **Improved bed management/patient flow**, 779 single rooms released for use elsewhere

Fixed probability of being PCR-negative by the next day (P) was 0.14 (95% CI = 0.12 - 0.16) for immunocompetent patients

- Implies half of immunocompetent pts are PCR-negative by 5-days post-diagnosis (95% CI = 5 - 6)

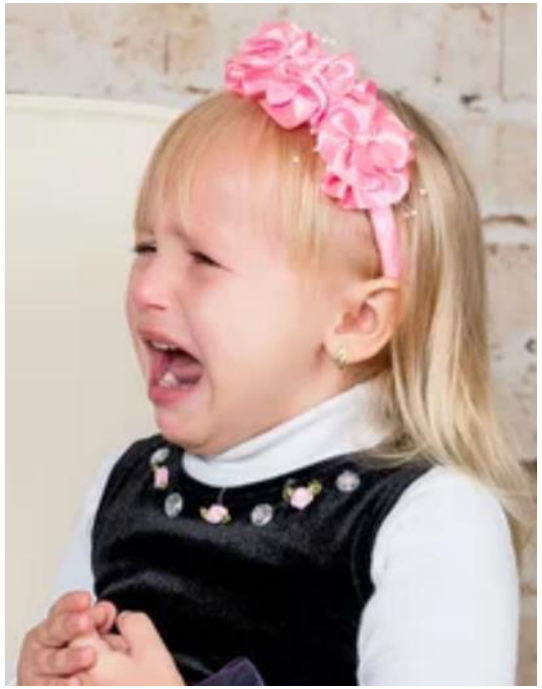
Youngs J. J Hosp Infect. 2019 Mar;101(3):276-284.

Effect of POCT for Respiratory Pathogens on Antibiotic Use in Children: An RCT

Unblinded, RCT

Pediatric ED, Oulu University Hospital, Finland

- 1243 children with fever and/or respiratory signs/symptoms
  - Randomized 2:1, Intervention (n=829) or controls (n=414)
    - Multiplex POCT NAAT (18 respiratory viruses and 3 bacteria), analysis time 70 mins
    - Routine care, included rapid lab-based flu/RSV NAAT, results in 2-3 hours
  - Mean (sd) age 3.0 (3.6) yrs



- POCT did not change
  - Antibiotics prescribing, POCT n=226 (27.3%) vs 118 (28.5%) controls
    - Risk ratio=0.96; 95% CI, 0.79-1.16
  - Diagnostic tests
  - Costs

Mattila S. JAMA Netw Open. 2022 Jun 1;5(6):e2216162.

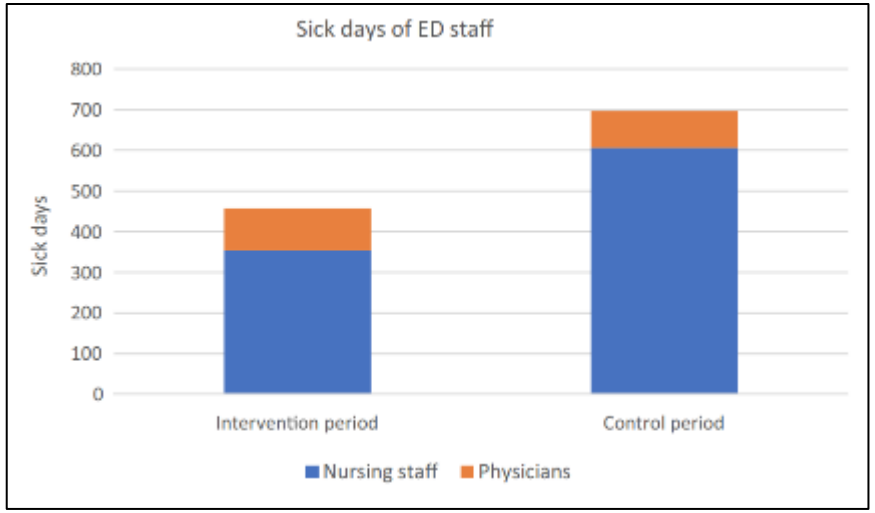
POCT for flu in a university ED: A prospective study

n=828 Adults, fever (≥38°C), respiratory symptoms

n=375 (intervention group) POC Influenza A/B NAAT (cobas® Liat®); 103 (27.6%) flu (+)

Intervention, POCT

- **Fewer staff sick days**, reduced by 34.4%, p = 0.023
- More patients received:
  - **Antivirals**, 7.2% vs 3.8%, p = 0.028
  - **Antibiotics**, 40.0% vs 31.6%, p = 0.033
- High rate of patients **transferred** to external hospitals, 5.6% vs 1.3%, p = 0.01



POC testing for influenza is useful in the ED

Perlitz B. Influenza Other Respir Viruses. 2021 Sep;15(5):608-617.

The impact of rapid molecular diagnostic testing for respiratory viruses on outcomes for ED pts

- ‘Before/After study, consecutive pts, 4 urban EDs, New South Wales
- 1491 multiplex NAAT (July–December 2016)
- 2250 rapid NAAT (July–December 2017)

Rapid NAAT

- **Fewer hospital admissions**, 1649 (73.3%) v 1159 (77.7%), p < 0.001
- **More results received before ED discharge**, 67.4% v 1.3%, p < 0.001
- **Shorter median test TAT**, 2.4 h [IQR, 1.6–3.9 h] v 26.7 h [IQR, 21.2–37.8 h], p < 0.001
- **Lower hospitalization rates**, if <18 (50.6% v 66.6%; p < 0.001) or >60 years (84.3% v 91.8%), p < 0.001
- **Diagnostic stewardship; fewer orders for blood cultures, sputum culture, ABG’s, respiratory bacterial and viral serology**, p < 0.001
- ED LOS similar for rapid (7.4 h; IQR, 5.0–12.9 h) and standard PCR (6.5 h; IQR, 4.2–11.9 h), p = 0.27

Wabe N. Med J Aust. 2019 Apr;210(7):316-320.

Using a novel rapid viral test to improve triage of ED patients with acute respiratory illness during flu season

- Prospective cohort, consecutive ED patients, ARI symptoms
  - POC Influenza A/B / RSV NAAT (Roche cobas® Liat ®), physicians and patients blinded to results
  - Lab-based NAATs, standard of care

- 52.9% POC NAAT (+)
  - **~70%** put in rooms shared with non-ARI pts
  - **27.3%** prescribed antibiotics
  - **77.8%** of oseltamivir-eligible patients did not receive tx
- **POC NAAT in ED triage**
  - Potential to:
    - Improve social distancing practices through better triage
    - Increase appropriate prescription of antimicrobials

Stanford University

Pedersen CJ. J Clin Virol. 2018 Nov;108:72-76.

Systematic review of the impact of POCT for flu on the outcomes of pts with acute respiratory tract infection

- Systematic review
- Assess effect of POCT flu on 3 outcomes:
  (1) antiviral Rx, (2) antibiotic Rx, (3) ED LOS
- Searched Medline and Embase; MeSH terms/keywords:
  influenza, POCT, antivirals, antibiotics, and LOS
- 245 studies, 30 included

Most studies reporting antiviral Rxs found flu (+) POCT result:

1) increased the use of antivirals

2) decreased antibiotic use

Studies assessing effect of POCT on ED LOS were not definitive.

Egilmezer E. Rev Med Virol. 2018 Sep;28(5):e1995.

What did you see today?

An extra ER hour kills

16,201,036 patients

A minute faster TAT shortens ER stay

4,483,169 ED visits

Patient Satisfaction/Quality Measures
1 – 3% of reimbursement

POCT for Respiratory Infectious Diseases Improves ER Patient Care

France	**676**	**More ER discharges**
Ireland	**7,150**	**More ER discharges**
USA	**197**	**Faster TAT, no d/c speed change**
USA	**61**	**Faster discharge, fewer tests and antibx**
France	**3,333**	**Faster discharge**
France	**866**	**Faster discharges**
USA	**12,263**	**Less COVID-19 exposure**
UK	**717**	**Shorter LOS**
Finland (peds)	**1,243**	**No changes**
Germany	**828**	**Less sick staff**
Australia	**1,491**	**Fewer patients hospitalized**
USA	**119**	**Improved social distancing**
Total	**28,944**	


That's all Folks!

Kimberly Evans, RN

Emergency Department
Unit Supervisor

University of South Alabama

Children's and Women’s Hospital

Rapid Viral Testing in the Emergency Department

Why we changed

How we changed

Why we call it a success

KIMBERLY EVANS, RN

Emergency Department Unit Supervisor

University of South Alabama
Children's and Women’s Hospital

Disclosures

- Speaker honorarium, Abbott

WHY WE CHANGED

In The Beginning - Physician-driven Respiratory Testing

ED PRESENTATION

Symptomatic for ILI or GAS

RN TRIAGE

Treatment room

Waiting room

CLINICIAN EXAM/ ORDERS

SWAB(S) COLLECTED/ SENT TO MAIN LAB

ED SPECIMENS PLACED IN QUEUE

ED WAIT

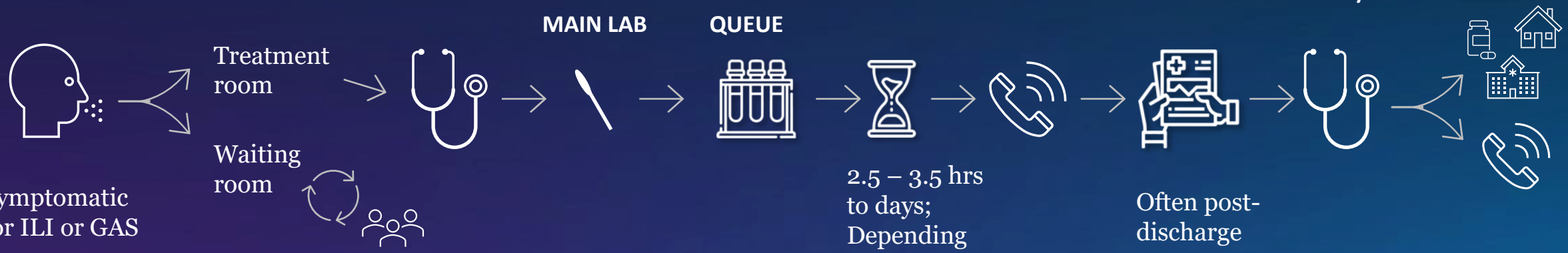
2.5 – 3.5 hrs to days; Depending on timing

CALL(S)

REPORT

Often post-discharge

PT MGMT/DISPOSITION DECISIONS, ADJUSTMENTS /FOLLOW-UP

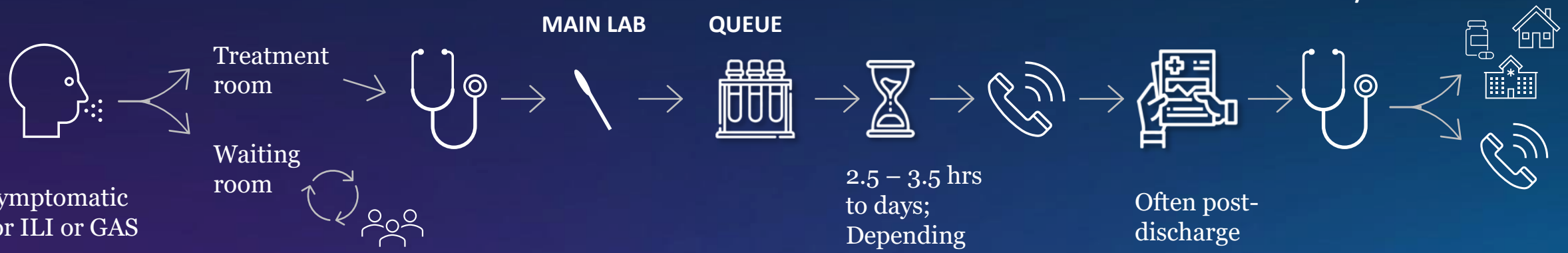


ILI, influenza like illness; GAS, Group A Strep

WHY WE CHANGED

In The Beginning - Physician-driven Respiratory Testing

ED PRESENTATION → **RN TRIAGE** → **CLINICIAN EXAM/ ORDERS** → **SWAB(S) COLLECTED/ SENT TO MAIN LAB** → **ED SPECIMENS PLACED IN QUEUE** → **ED WAIT** → **CALL(S)** → **REPORT** → **PT MGMT/DISPOSITION DECISIONS, ADJUSTMENTS /FOLLOW-UP**



Symptomatic for ILI or GAS

2.5 – 3.5 hrs to days; Depending on timing

Often post-discharge

ILI, influenza like illness; GAS, Group A Strep

COVID-19
changed the game

Negative Factors Affecting the ED

- Patient **throughput** was at a standstill
- Average **LOS**, 3.5 to 5hrs and that was on a real good day
- Extended **wait times** for testing results lead to limited treatment rooms for arriving patients.
- Substantial **surges** of patients with mild symptoms or with recent exposure presenting out of fear of infection and they want answers, and they want them quick

Negative Factors Affecting the ED

- Potential increased **exposure** for staff and visitors
- **Staffing** shortages
- Patient and family experience/**satisfaction** compromised
- **HCAP Scores** suffered.
  Unhappy angry patients and families = stressed staff

Respiratory Testing in the ED

Our ED Journey

A Better Process to Streamline Care

We built a small mini viral testing lab in the triage area

Patients who presented with respiratory symptoms or GAS symptoms were swabbed and placed in a Provider in Triage area to await results

Results were immediately available in the EMR using RALS interface

Provider had the result at front of visit, which allowed them to make a timely decision of additional treatment or disposition

WHAT WE CREATED

A New Operational Approach/ED workflow

ED PRESENTATION → **RN TRIAGE / SWAB ORDERS** → **SWAB(S) COLLECTED** → **TESTS RUN IN ED MINI LAB** → **REPORT** → **ISOLATION/ COHORT** → **RESULTS REVIEW/ PT EXAM** → **PT MGMT AND DISPOSITION DECISIONS**

Symptomatic for ILI or GAS

2 – 13 mins

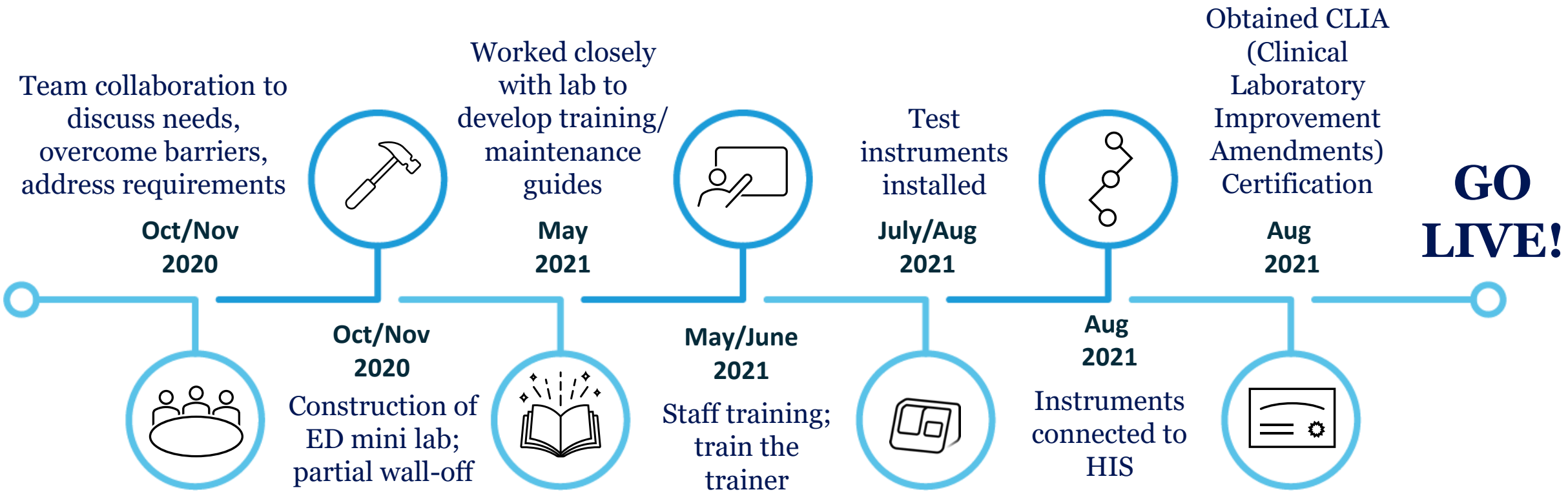
Reduce patient and staff exposure time

ILI, influenza like illness; GAS, Group A Strep

TESTING PROTOCOL FOR ED MINI LAB BASED ON DIFFERENTIAL

COVID-19 only | COVID-19, Flu, RSV | GAS

Steps to Establish a Better Process



HIS, hospital information system

HOW WE MADE THE CHANGE

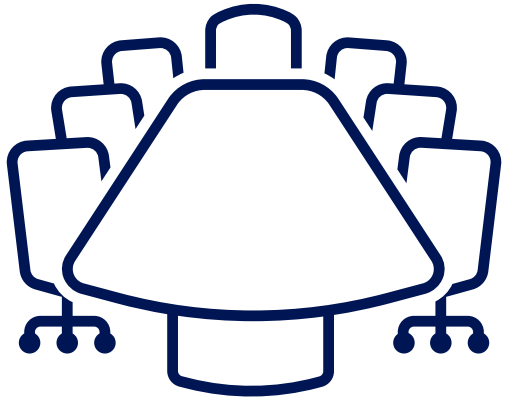
Brought team together including physicians, nursing, administration and lab leadership

All parties committed to improving the process

All members of the team presented what they needed and required

All members of the team came to the table with answers (not just questions) and solutions (not just issues)

Administration Wants

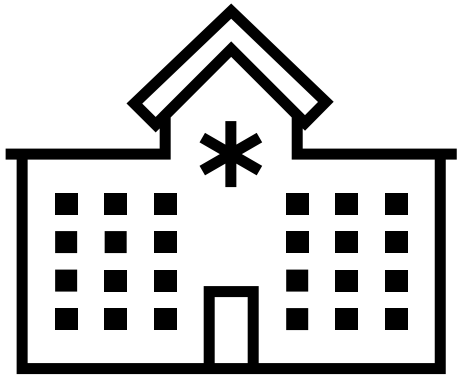


- Improved patient satisfaction
- Results without budget sacrifice (staffing, space dedicated for testing area)

Physician Wants

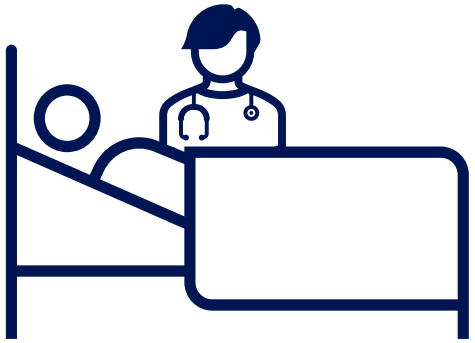
- Easy process that would not put increased demands on staff
- Efficient way to obtain timely results for a more rapid developing plan for treatment/disposition
- Method for mid-level practitioners to run a rapid treatment area for patients presenting with influenza type illness or GAS symptoms

Lab Wants



- Method to track education for personnel preforming testing
- Method to track and confirm that proper quality controls were completed.
- Method to track appropriate cleaning of equipment
- Random audit review for invalid results

Nursing Wants



- Process that would NOT create an increased burden on staff who felt they were already working stretched
- Protocol orders for who should be tested
- Decrease LOS for patients in the waiting room
- Method to easily identify patients who required isolation

Clinical, Operational and Laboratory

Concerns and Solutions

Clinical and Operational

Test Sensitivity

Confirmation Testing

Staffing

Demand

Inventory Management

Solutions to Clinical and Operational Concerns

Test Sensitivity | Confirmation Testing | Staffing | Demand | Inventory Management

Test Reliability / Sensitivity

Selected highly accurate **molecular test** method

- **~93%** of positive samples; > **98%** of negative samples
- More accurate than an antigen test
- Sensitive for testing needed for emergency population

Maintained consistent chart reviews; found no issues with false negative results

Detection: Antigen vs Molecular

Test Sensitivity

ANTIGEN TESTS

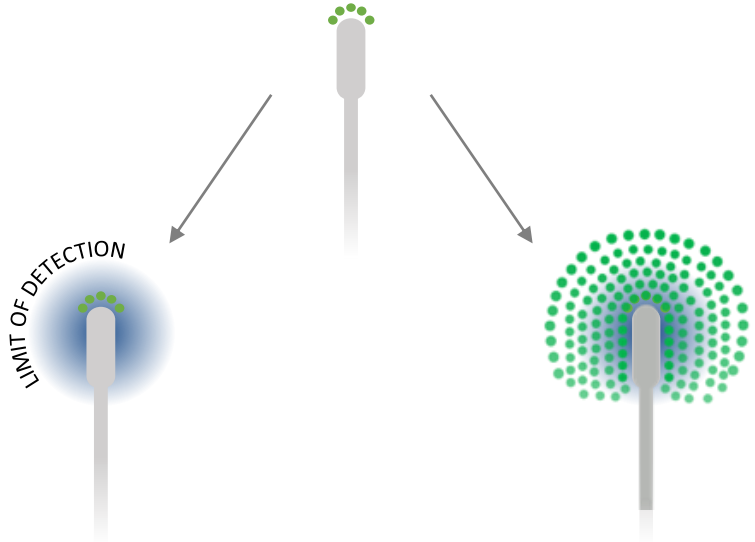
Rapid Antigen Detection Tests (RADTs)[1]

NO AMPLIFICATION

Detects the presence of available pathogens (virus or bacteria)

POSITIVE PATIENT

Sample Containing Antigen/RNA



MOLECULAR TESTS

Nucleic Acid Amplification Tests (NAATs)[2]

AMPLIFICATION

Amplifies the sample millions of times for easier pathogen detection

Lower levels of pathogen are **less likely to be detected**

Lower levels of pathogen are **more likely to be detected**

SELECT TEST BASED ON HEALTHCARE NEEDS FOR RAPID RESULT AND TEST UTILITY

1. Carter LJ, Garner LV, Smoot JW, et al. Assay Techniques and Test Development for COVID-19 Diagnosis. ACS Cent Sci. 2020;6(5):591-605.
2. CDC. Nucleic Acid Amplification Tests (NAATs). https://www.cdc.gov/coronavirus/2019-ncov/lab/naats.html, updated June 14, 2021.

Molecular Amplification: 2 Approaches

Test Sensitivity

THERMOCYCLING

PCR

- Requires **temperature change** to amplify genetic material
- Each temperature cycle is a cycle threshold (Ct)

ISOTHERMAL

NEAR LAMP HDA

- Enzymes **DO NOT** require temperature change to amplify genetic material
- Reactions occur simultaneously, no cycling; may speed time to result

PCR, polymerase chain reaction; NEAR, Nicking Enzyme Amplification Reaction; LAMP, Loop Mediated Isothermal Amplification; HDA, Helicase Dependent Amplification

Solutions to Clinical and Operational Concerns

Test Sensitivity | **Confirmation Testing** | Staffing | Demand | Inventory Management

Confirmation Testing

Negative tests with a strong exposure history received additional testing, using back-up PCR

Solutions to Clinical and Operational Concerns

Test Sensitivity | Confirmation Testing | **Staffing** | Demand | Inventory Management

Staffing

New staffing strategy; Redistribution of staff to run testing area; added RN, which was OK'd by admin; scheduling assignments coordinated for efficiency

RNs welcomed new process, remained supportive after implementation

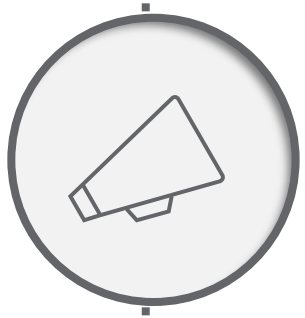
Solutions to Clinical and Operational Concerns

Test Sensitivity | Confirmation Testing | Staffing | **Demand** | Inventory Management

Demand

Pressure from community to be utilized as a testing center…

Resolved with community education



Solutions to Clinical and Operational Concerns

Test Sensitivity | Confirmation Testing | Staffing | Demand | Inventory Management

Inventory

Maintaining adequate stock of testing supplies

New ordering processes implemented to keep stocked

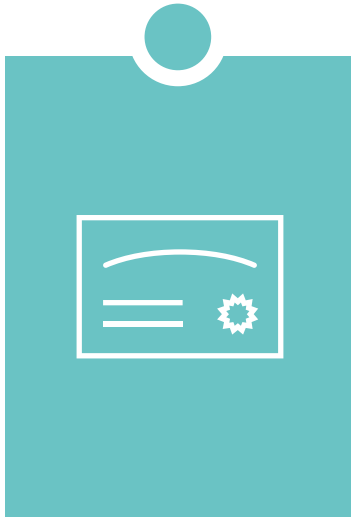
CONCERNS ENCOUNTERED

Laboratory

Meeting Test Quality Standards

Program Mgmt/Oversight

Licensure



Impact on Revenue

Impact on Lab Staffing

Solutions to Address Laboratory Concerns

Meeting Test Quality Standards | Program Mgmt/Oversight | Licensure | Impact on Revenue | Impact on Lab Staffing

Quality Standards

Compliance with testing regulations; training and competency checks for all operators

CLIA waived test:

- Test and QC procedure feasible for non-lab personnel QC/Calibration per instructions; auto-lock if internal QC fails
- Logs and documentation, record of corrective actions

Solutions to Address Laboratory Concerns

Meeting Test Quality Standards | Program Mgmt/Oversight | Licensure | Impact on Revenue | Impact on Lab Staffing

Program Management and Oversight

- Documentation of all operations, testing, QC and measures to meet quality standards
- Quality Management reviews consistently performed to ensure reliability of test results
- Probation period of weekly logs to demonstrate following proper procedures
- On-going guidance and support from the Laboratory
- Streamlined program management with IT/connectivity

Staff Training and Competency

ESTABLISH PROCEDURES

- Staff Training
  - Authorized to perform POC respiratory tests (pre-analytic, analytic and post-analytic)
  - i.e., PCA's, paramedics
- Staff retraining, when problems identified
- Staff competency assessments, annually
- Documentation, retain records 2 years

Consolidated Management and Ease of Documentation with Connectivity

CONNECTIVITY

Track Staff Training/
Retraining Needs

Test Results/
Test Logs

QC Results/
QC Logs

Data Review

Maintenance/
Corrective Action

Annual Staff
Competency

Solutions to Address Laboratory Concerns

Meeting Test Quality Standards

Program Mgmt/Oversight

Licensure

Impact on Revenue

Impact on Lab Staffing

Licensure

Obtain testing license for the ED Mini Lab

Established ED Mini Lab as CLIA test site separate from the laboratory license

Solutions to Address Laboratory Concerns

Meeting Test Quality Standards

Program Mgmt/Oversight

Licensure

Impact on Revenue

Impact on Lab Staffing

Revenue

- Might reduce revenues for the laboratory
- Rapid tests had insignificant impact on the lab revenues

Solutions to Address Laboratory Concerns

Meeting Test Quality Standards

Program Mgmt/Oversight

Licensure

Impact on Revenue

Impact on Lab Staffing

Test Demand/ Lab Staffing

- Might reduce lab budget for staffing
- Testing remained high for other patient populations with less urgent testing needs

What We Achieved

ED Mini Lab

Results

Administration

Physicians

Lab

Nursing

- HCAP patient satisfaction scores improved greatly
- Only 2 FTE positions were added
- Space already existing was utilized for the designated testing lab

Results

Administration

Physicians

Lab

Nursing

- Decrease in patient throughput opened treatment rooms for higher acuity patients
- Patients could be seen by the mid-level practitioner
- Results were available within 20 minutes of patient's arrival with interface connectivity
- Reduced time to appropriate patient care

Results

Administration

Physicians

Lab

Nursing

- All employees were educated on performance of rapid testing lab on orientation to unit and complete annual competencies.
- QC is completed and logged and made available to Lab for review.
- Equipment is cleaned daily, and cleaning is recorded on daily log and available for Lab review.
- A daily report is done and reviewed for all invalid results with appropriate interventions such as staff counseled/re-educated documented as well
- CLIA certificate valid and renewed
- Added bonus: Fewer urgent tests from the ED; reduced calls requesting an update on wait time for a test result

Results

Administration

Physicians

Lab

Nursing

- Assigned staffing responsibilities did not increase
- PCA's and Paramedics were included in education and training on testing which decreased nursing workload
- Standing protocol orders were built and approved by medical staff for use to determine testing parameters.
- The decreased in the patient throughput help to decrease the backup of patients waiting on a treatment room.
- Patients were quickly identified as needing isolation which lead to a decreased staff and visitor exposure.

Achieved Goals

Testing and diagnosing questions at time of ED visit

Patients/families happier = happier employees

Fewer employees exposed and absent

Results available for provider as soon as patient placed in treatment area

Upstream efficiencies helped improve downstream throughput

All team member's support and are satisfied with process

What Others Have Achieved with Rapid Respiratory Testing in the ED

- 63% reduction - **time to treatment** (7.9 to 2.9 hours) [1]
- 19.8% decrease - **ED LOS** (74 min reduction) [1]
- 66% reduction - **exposure time** of infected patients with uninfected patients [2]
- Up to 82% reduction - **hospital acquired infections** [3,4]
- Increase - **COVID-19 treatment capacity** (~1,009 hours/hospital/week) [2]
- Significant reduction - **unnecessary infection control measures** (isolation rooms and PPE) [2]

1. Peaper DR, et al. Clinical impact of rapid influenza PCR in the adult emergency department on patient management, ED length of stay, and nosocomial infection rate. Influenza Other Respir Viruses. 2021;15(2):254-261.
2. Hinson JS, et al. Targeted rapid testing for SARS-CoV-2 in the emergency department is associated with large reductions in uninfected patient exposure time. J Hosp Infect. 2021;107:35-39.
3. Teoh TK, et al. Outcomes of point-of-care testing for influenza in the emergency department of a tertiary referral hospital in Ireland. J Hosp Infect. 2021 Apr;110:45-51.
4. Garvey MI, et al. Impact of a PCR point of care test for influenza A/B on an acute medical unit in a large UK teaching hospital: results of an observational, pre and post intervention study. Antimicrob Resist Infect Control 8, 120 (2019).

Summary

- COVID-19 was game changer; increased need for rapid testing in the ED
- New operational protocol for triage; RN driven vs. physician driven testing
- Highly accurate, reliable and rapid testing was feasible using CLIA waived rapid molecular test
- Upstream efficiencies helped improve downstream throughput, reduce transmissions, improve staff safety, and increase patient satisfaction by giving patients the care they expected in a timeframe they demanded
- HCAHPS scores have motivated implementation of mini lab with RN-driven rapid respiratory testing in sister hospital

Questions

Available CE Credit

P.A.C.E.®

Florida laboratory CE

Certificate of Attendance

To Receive Certificate of Attendance

After today's webinar:

- A certificate of attendance available for all attendees
- Evaluation form will appear automatically
- Must complete Eval to receive Certificate link via email
- **For groups: Those logged in will receive Email from messenger@webex.com with link to evaluation. Forward email to colleagues who attended with you!!!**
- Double-check email address

Joined Using a Mobile Device?

Evaluation won't appear automatically, but…

Watch for email with link to evaluation!

Recording

Within a few days following today's event, visit

https://www.whitehatcom.com/abbott

Collaboration in Extending Respiratory Testing to the Emergency Department

Live Event: Thursday, May 11, 2023 | 1:00 - 2:00 PM Eastern Time
P.A.C.E.® credit available until May 11, 2024
Florida Laboratory CE Credit available

RECORDING

SLIDES

Please join this session for an insider's view of respiratory testing in the Emergency Department (ED). Experts from the ED will share real-world experience with clinical and operational examples of patients presenting with symptoms related to respiratory illness. Our speakers will also discuss strategies for influencing and implementing rapid testing at the point of care for respiratory infectious diseases, such as COVID-19, Influenza, RSV, and Group A Strep.

The webinar will:

- Describe apparent (and less apparent) factors that affect care in the ED
- Analyze the role of timely diagnostic test results on patients, ED staff, and the healthcare system
- Examine approaches and evidence for delivering results to decrease time to targeted patient care and infection control decisions
- Assess strategies where ED influence and laboratory collaboration helped facilitate the implementation of POC testing

Presenters:

Kimberly Evans, RN

Emergency Room Nurse
University of South Alabama Children's and Women's Hospital
Mobile, AL

Frank Peacock, IV, MD, FACEP, FACC, FESC

Professor of Emergency Medicine
Emergency Medicine Vice Chair for Research
Baylor College of Medicine
Houston, TX

Moderator:

Collaboration in Extending Respiratory Testing to the Emergency Department

NOTE: If you have just viewed the archived recording of this webinar, you can access the evaluation using the link in the email you received after submitting the recording request form. Alternatively, you can access the evaluation for **12 months** after the live event at:

https://www.whitehatcom.com/Abbott_Evals/Respiratory_051123/ED_051123_eval.html

Abbott