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# In Matters of the Heart, You Have Precious Little Time

TRACKING

# Flu is on the horizon

bringing the potential to make a critical situation worse.

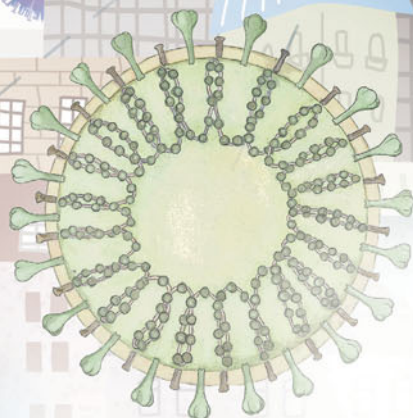


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# The Challenge of Inequity in Urgent Care Medicine: A Call to Action

■ LINDSEY E. FISH, MD

The young black couple walked into our urgent care clinic, eyes wide and filled with fear, hope, and expectation. Wrapped in her mother's arms was their 3-day-old beautiful baby girl, a child born in the midst of two scourges—the COVID-19 pandemic that was sweeping our country and world, and the pandemic of racial inequity that was surfacing due to peaceful protests and violent riots occurring throughout our cities and rural communities alike.

The parents' request for their child was simple: "Please help us get oxygen for our baby girl." Their daughter needed oxygen and had been discharged abruptly from the hospital due to COVID-19 concerns; however, despite calling the oxygen company, their primary care provider, and the nurse assistance phone line, the small tank they were given at hospital discharge was almost empty and their requests for more had gone unanswered. As they walked out of our urgent care center with an adult oxygen tank from our clinic supply (we would work it out with the oxygen company later), the parents said, "Thank you for helping us, when no one else would. We are truly grateful."

The United States, despite the words of the Declaration of Independence, is not a country built with equity in mind. Our government, as well as our systems of education, justice, and health-care, may strive for equal treatment for all, but often fall short of the mark. Unfortunately, urgent care also has fallen short of achieving equity for all our patients; inequity exists as a result of access issues to UC locations, upfront payment requirements, and lack of attention to the issue itself.

It is time for urgent care medicine to turn our attention to the

racial and other systemic injustices in our field. Urgent care clinics in the U.S. are disproportionately located in affluent areas because these areas have a more favorable payer mix<sup>1</sup> (which is a sterile way of saying fewer poor patients). This distribution creates obvious inequity in access to urgent care services. Those with no insurance or government insurance often do not have an urgent care center in their community and, sadly, also lack transportation resources necessary to seek care at more distant sites.

While many urgent care clinics are located in urban settings, they tend to sit in more well-off areas and gentrified neighborhoods. As such, patients of lower socioeconomic status (many of whom are underrepresented minorities) may have significantly more difficulty accessing urgent care centers than more wealthy residents in the same city. Additionally, many urgent care clinics have insurance and/or upfront payment requirements that must be met before patients can be seen by a provider. Many would-be patients of lower socioeconomic status do not meet these requirements and are therefore unable to receive care.

Disparities exist in every medical specialty. Acute care medicine is no exception. Patients who preferentially seek care in urban urgent care settings tend to be at relatively high risk for having unmet preventive medical needs.<sup>2</sup> Underrepresented minority patients experience greater difficulties in accessing primary care for a multitude of reasons, which increases the need for care in sites such as the ED.<sup>3</sup>

Studies which show increased utilization of urgent healthcare in Latino and African-American patients with asthma also illustrate this phenomenon.<sup>4</sup> As such, those of us in urgent care medicine should be cognizant of the greater need for UC access in these populations because of a lack of primary care. While data stratifying UC outcomes by race are nonexistent, it is reasonable to presume that the phenomenon in disparities in other settings<sup>5</sup> would also be present in urgent care. Furthermore, the lack of attention to this issue within the urgent care community is, in



**Lindsey E. Fish, MD** is Medical Director at Denver Health's Peña Southwest Urgent Care Clinic and an Assistant Professor of Medicine at the University of Colorado School of Medicine.



## URGENT PERSPECTIVES

on a national scale.

Now is the time of action. There are no guidelines for creating equity for access to quality urgent care. However, we can look in the mirror at the inequity in UC and use this moment as an opportunity to advance our field toward greater racial equality. We can begin with small steps, by looking to remove the barriers that create inequities within our field one brick at a time. We can begin by having open and honest conversations regarding inequity in urgent care both as a field and within our own clinics and organizations. These conversations may not always be easy, but they will bring attention to the current injustices in our field.

Once we have identified the inequities present in our clinics, let us move to action. Small steps such as community outreach events with free influenza vaccinations or free sports physicals in underserved communities would go a long way. Supporting local health fairs that offer free health screenings would also be beneficial.

We do not have to do this alone. We can partner with local organizations to refer patients to primary care practices that provide care to patients regardless of race, socioeconomic status, or insurance status. We are a field of innovation, and now is the time to turn our ingenuity toward equity in urgent care access.

It's time to get to work, so as to live up to our mission of being the specialty dedicated to access to efficient, affordable acute care.

As C.S. Lewis said, "You can't go back and change the beginning, but you can start where you are and change the ending." So, the challenge before us in urgent care medicine is to bring attention to the current state of our system and find the moral courage to take action. The need for financial viability is real for urgent care centers, but we must solve these issues so all patients—regardless of race or socioeconomic status—feel they will be cared for at their local urgent care center when they're unable to get help elsewhere. ■

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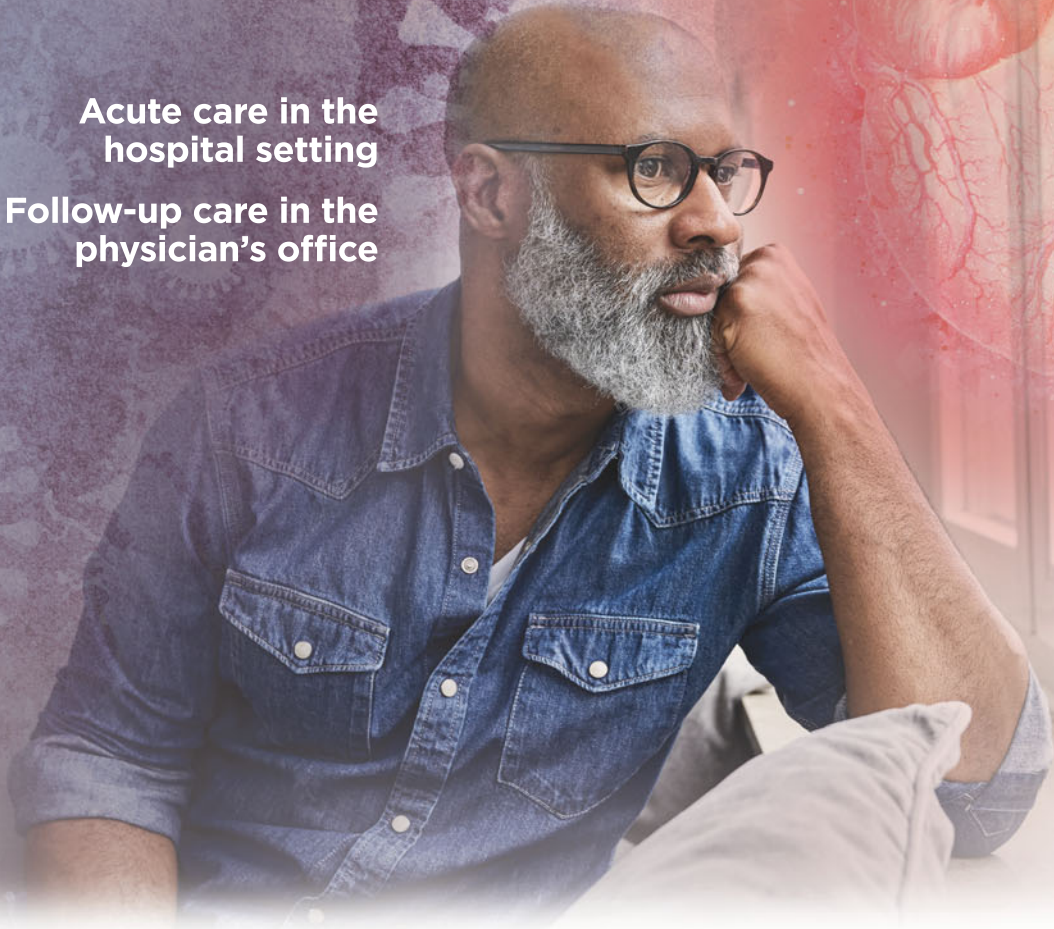


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\*Data sources on file at Quidel.

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## ORIGINAL RESEARCH

### 31 A Multicenter Study of the Rate of MACE in Chest Pain Patients with a Moderate HEART Risk Score Referred from Urgent Care for an Expedited Outpatient Cardiology Evaluation

The HEART score has been praised as an effective way to predict how a patient with chest pain will fare. But what is its impact in urgent care decision-making? This original research seeks to answer that question.

*Svetlana Barbarash, MD, FACC; Dolores Lebron-Gallagher, MS PA-C; Hollis Julson, MD; and Michael B. Weinstock, MD*

## ORIGINAL RESEARCH

### 12 Evaluation of a Point-of-Care COVID-19 Testing Platform Using Self-Collected Nasal Swabs in an Urgent Care Setting



Point-of-care testing for COVID-19 has been celebrated as a breakthrough tailor-made for urgent care. It's also been pegged as unreliable due to reports of false negative results. These urgent care researchers sought clarity.

*Bronson Elizabeth Delasobera, MD; Amanda Joy, PA; Masashi Waga; Rita Malley, MS; Anisha Patel, MS; Sarah Greenwood, PA; Jerry Creighton, RN; Sameer Desale, MS; and Moira Larsen, MD, MBA*

## CLINICAL

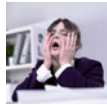
### 15 A 41-Year-Old Woman with Multiple Complaints



Patients with multiple complaints raise multiple concerns. Plotting the best course of action is essential to the patient's prospects, but also to your legal risk if there's a bad outcome. *Michael B. Weinstock, MD; David A. Farcy, MD FAAEM, FACEP, FCCM; and Ramin Vejdani, DO*

## HEALTH LAW AND COMPLIANCE

### 27 Does the OSHA General Duty Clause Encompass Psychological or Emotional Injury?

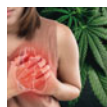


When physical abuse or unsafe conditions exist in the workplace, the course of action is obvious. But where do harassment, bullying, and toxic gossip fall under the OSHA General Duty Clause?

*Alan Ayers, MBA, MAcc*

## CASE REPORT

### 36 Cannabis-Associated Myocardial Infarction in a Young Woman Without Other Cardiac Risk Factors



A young woman presents with signs of an MI despite having relatively few risk factors. Could marijuana use be the culprit?

*Bella Nagappan, MD and Susanne Demeester, MD*

## AHEAD IN JUCM

As the world continues to wrestle with global illness, it's important for all urgent care providers and operators to recognize the unique attributes and challenges of treating younger patients. In the October issue of *JUCM*, we'll offer several original articles that examine how to approach the care of pediatric patients in the context of the COVID-19 pandemic—including new, urgent care-specific research.

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## JUCM CONTRIBUTORS

The very mention of the phrase *chest pain* tends to be a show-stopper in any setting—certainly including urgent care. You need to get to the root of the problem quickly in order to make a timely decision on treatment vs referral vs emergent transport.

This sense of urgency possessed us to offer a selection of original articles—including a new, urgent care-centered study—on the subject of cardiovascular-related presentations.

That research article, A Multicenter Study of the Rate of MACE in Chest Pain Patients with a Moderate HEART Risk Score Referred from Urgent Care for an Expedited Outpatient Cardiology Evaluation (page 31), puts a critical eye on how much influence the HEART risk assessment system has (or should have) when a patient presents to an urgent care center, in terms of getting the patient to the right care setting as quickly as possible. Authors **Svetlana Barbarash, MD, FACC; Dolores Lebron-Gallagher, MS PA-C; Hollis Julson, MD; and Michael B. Weinstock, MD** drew their findings from analysis of 133 patients at five urgent care locations in Las Vegas. Dr. Barbarash is affiliated with Southwest Medical, part of OptumCare, Las Vegas, NV, where Dr. Lebron-Gallagher practices in the Department of Cardiology. Dr. Julson is there, as well, in the Department of On Demand Medicine. Dr. Weinstock is affiliated with the Department of Emergency Medicine, Adena Health Systems, Chillicothe, OH. He's also senior editor, clinical content for *JUCM*.

Dr. Weinstock is also one of the driving forces of A 41-Year-Old Woman with Multiple Complaints (page 15), adapted from the book *Bouncebacks! Critical Care*. In this article, he and coauthors **David A. Farcy, MD, FAAEM, FACEP, FCCM** and **Ramin Vejdani, DO** recount the harrowing tale of a woman with a host of symptoms that proved to distract the treating physicians from the true nature of her presentation.

Dr. Farcy practices in the Department of Emergency Medicine, Emergency Medicine Critical Care at Mount Sinai Medical Center. Dr. Vejdani also practices at Mt. Sinai.

Another article based on real-life events appears on page 36. Cannabis-Associated Myocardial Infarction in a Young Woman Without Other Cardiac Risk Factors, by **Bella Nagappan, MD** and **Susan Demeester, MD** shares the lessons learned from the care of a young woman who on the surface seemed like the last person to be presenting with a potentially catastrophic illness.

At the time of presenting the article, Dr. Nagappan was a PGY-4 Emergency Medicine Resident at the University of Michigan. Dr. Demeester is director, Emergency Observation Center at Saint Joseph Mercy Hospital.

Unfortunately, the COVID-19 pandemic continues to be a daily concern. One nagging question: Why were point-of-care tests slammed for too many false negatives? Our second original

research piece in this issue tackles that question head on. Read Evaluation of a Point-of-Care COVID-19 Testing Platform Using Self-Collected Nasal Swabs in an Urgent Care Setting by **Bronson Elizabeth Delasobera, MD; Amanda Joy, PA; Masashi Waga; Rita Malley, MS; Anisha Patel, MS; Sarah Greenwood, PA; Jerry Creighton, RN; Sameer Desale, MS; and Moira Larsen, MD, MBA**, starting on page 12 to learn what the authors discovered.

Dr. Delasobera is with Medstar Health Urgent Care/Medstar Ambulatory Services and Georgetown University. Ms. Joy is also with Medstar, as are Dr. Waga, Ms. Greenwood, Mr. Creighton, and Ms. Desale. Ms. Patel, Ms. Malley, and Dr. Larsen are with Georgetown University School of Medicine; Dr. Larsen also practices at Medstar Franklin Square Hospital.

While all these clinical issues are occurring, never forget that urgent care centers are also workplaces. It goes without saying that employees should be free from the threat of physical injury, but where does the threat of emotional or psychological injury fall? In Does the OSHA General Duty Clause Encompass Psychological or Emotional Injury? (page 27), **Alan A. Ayers, MBA, MAcc** explains when harassment and toxic gossip can pose a serious liability threat.

### Also in this issue:

Our focus on cardiovascular issues extends to this month's Abstracts in Urgent Care column (page 24). We're grateful to **Ivan Koay, MBChB, FRNZCUC, MD**, an urgent care physician in Dublin, Ireland who is also an examiner for the Royal New Zealand College of Urgent Care, for keeping us up to date on literature concerning relevant risk assessment tools and other cardio-related topics relevant to urgent care.

Finally, in Revenue Cycle Management (page 47), **Monte Sandler** offers a preview of 2021 changes to the ICD-10 coding system. Mr. Sandler is vice president, revenue cycle management for Experity.

### Thanks to Our Peer Reviewers

In every issue of *JUCM*, there are select articles on which we ask members of our peer review panel to comment. It's one step we take in trying to ensure that all the content we publish is relevant, clearly communicated, and free of bias. For their contributions in reviewing content for the July–August and September issues, we thank: **Sal D'Allura, DO, FAAFP; Aldo C. Dumlao, MD; Glenn Harnett, MD; Gina Nelson, MD; James B. Short, MD; and Joseph Toscano, MD**

If you'd like to support our mission to publish quality, urgent care-specific content by volunteering to be a peer reviewer, please send an email with a CV to: [editor@jucm.com](mailto:editor@jucm.com). ■

# Chaos Theory

■ LOU ELLEN HORWITZ, MA

There's a danger in overthinking things. If you play golf, or are a juggler, or have ever managed or created something enormously complicated, you are familiar with that moment when you know that if you think too hard about what is happening it will all fall apart.

Most of creativity is a pretty wobbly process. All of the metaphors related to creativity involve a degree of messiness. Some of the ideas you throw at the wall don't stick. Sometimes "spitballing" something just gets spit all over everyone. Thinking outside the box leaves a lot of stuff lying around on the floor. Scientific experimentation often leads to evaporated eyebrows, and so on.

And yet professionals don't like to think of themselves as messy people. Team members don't like to think of their bosses as being a mess. Messiness creates chaos, uncertainty, fear and sometimes actual danger.

But the need for change demands creativity, so how do we all balance these competing, conflicting needs and our feelings about them? Do we just have to accept it or clench our teeth and get through it, or is there a better way?

You can probably guess that I think there's a better way. I'm talking about faith, and confidence, and belief.

*Chaos theory* is an interdisciplinary theory stating that, within the apparent randomness of chaotic complex systems, there are underlying patterns, interconnectedness, continuous feedback loops, repetition, self-similarity, fractals, and self-organization. What this means to me is that when it seems like your work or process is teetering on the edge of falling apart, there is apparently more at work than all of the little plates you've got spinning. There is something else going on that is impacting how it holds together that is not random. It can even be mapped mathematically.

So whether your faith is in mathematics, science, a higher power, the general powers of optimism, or you feel like you



*"You have been through chaos before and come out on the other side into something new, something of your own making, and you were still standing. You will do it again, and so will UCA."*

don't have any, that helps identify how you deal with chaos, uncertainty, and the creative process.

The first three quarters of 2020 have been a time of chaos and creativity. Much of it has been messy, when we've deeply wished it to be otherwise. But what I've seen emerge, in stories from all of you and even here inside UCA as we figure out where we are going next, is the beginnings of something new. Though I don't think any of us know exactly where it is going, it's already a little exciting.

This is that moment when we need to have confidence in ourselves and each other. When we need to have faith that all that we are doing and putting into place is going to work out. That no matter what the upcoming flu season throws at us, we believe deep down we will be able to handle it. Don't overthink it. Don't be overly critical. Do your best. Keep your options open.

Remember, you have been through chaos before and always come out on the other side into something new, something of your own making, and you were still standing. You will do it again, and so will UCA. I have faith in that, and I hope it's something we all share. ■



**Lou Ellen Horwitz, MA** is the chief executive officer of the Urgent Care Association.





# CONTINUING MEDICAL EDUCATION

**Release Date:** September 1, 2020

**Expiration Date:** August 31, 2021

## Target Audience

This continuing medical education (CME) program is intended for urgent care physicians, primary-care physicians, resident physicians, nurse-practitioners, and physician assistants currently practicing, or seeking proficiency in, urgent care medicine.

## Learning Objectives

1. To provide best practice recommendations for the diagnosis and treatment of common conditions seen in urgent care
2. To review clinical guidelines wherever applicable and discuss their relevancy and utility in the urgent care setting
3. To provide unbiased, expert advice regarding the management and operational success of urgent care practices
4. To support content and recommendations with evidence and literature references rather than personal opinion

## Accreditation Statement



URGENT CARE  
ASSOCIATION

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Urgent Care

Association and the Institute of Urgent Care Medicine. The Urgent Care Association is accredited by the ACCME to provide continuing medical education for physicians.

The Urgent Care Association designates this journal-based CME activity for a maximum of 3 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

## Planning Committee

- **Joshua W. Russell, MD, MSc, FACEP**  
*Member reported no financial interest relevant to this activity.*
- **Michael B. Weinstock, MD**  
*Member reported no financial interest relevant to this activity.*
- **Alan A. Ayers, MBA, MAcc**  
*Member reported no financial interest relevant to this activity.*

## Disclosure Statement

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# CONTINUING MEDICAL EDUCATION

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## Does the OSHA General Duty Clause Encompass Psychological or Emotional Injury? (page 27)

- 1. Which of the following elements is necessary for OSHA to prove a General Duty Clause violation?**
  - a. The employer failed to render its workplace free of hazard
  - b. A hazard was likely to cause death or serious harm
  - c. There was a feasible means by which the employer could have eliminated or materially reduced a hazard
  - d. All of the above
- 2. Employees who suffer from emotional abuse tend to exhibit all but which of the following effects?**
  - a. Anxiety
  - b. Binge eating
  - c. Personality changes
  - d. Very low self-esteem
- 3. Employees are also afforded protection from a hostile work environment by:**
  - a. The Equal Employment Opportunity Commission
  - b. The Department of Health and Human Services
  - c. The Department of Labor
  - d. The Americans with Disability Act

## A Multicenter Study of the Rate of MACE in Chest Pain Patients with a Moderate HEART Risk Score Referred from Urgent Care for an Expedited Outpatient Cardiology Evaluation (page 31)

- 1. The HEART score for chest pain patients in the emergency room incorporates all but which of the following?**
  - a. Age
  - b. Blood pressure
  - c. ECG
  - d. History
  - e. Troponin

## 2. The primary outcome for this study was:

- a. To assess the rate of MACE at 6 months and 1 year post evaluation in urgent care
- b. To determine if there is a decrease in rate of ED transfer after this protocol was introduced
- c. To examine the rate of MACE when patients with moderate HEART score were referred for expedited outpatient cardiology follow-up after evaluation in urgent care
- d. To measure hospitalization and mortality among patients who had been transferred to the ED after evaluation in urgent care

## 3. During the study period, the referral rate to the ED:

- a. Increased by 7%
- b. Decreased by 34%
- c. Remained unchanged
- d. None of the above

## Cannabis-Associated Myocardial Infarction in a Young Woman Without Other Cardiac Risk Factors (page 36)

### 1. CB1 cannabinoid receptors are primarily found in the:

- a. Cardiovascular system and periphery
- b. Central nervous system and periphery
- c. Cardiovascular system *and* central nervous system and periphery
- d. GI tract and periphery

### 2. Mittleman, et al found marijuana use had what effect on risk of ACS 60 minutes after use, compared with nonusers?

- a. Increased risk 2-fold
- b. Increased risk 4.8-fold
- c. Decreased risk by 7.3%
- d. There was no change

### 3. Cannabis use has been shown to cause:

- a. Dysrhythmias
- b. Postural hypotension
- c. Tachycardia
- d. All of the above
- e. None of the above

# Evaluation of a Point-of-Care COVID-19 Testing Platform Using Self-Collected Nasal Swabs in an Urgent Care Setting

**Urgent message:** A validated platform effective in performing rapid point-of-care tests for SARS-CoV-2 would be ideal for use in urgent care centers. Results of this study support the use of POC testing using self-collected nasal swabs.

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Citation: Delasobera BE, Joy A, Waga M, et al. Evaluation of a point-of-care COVID-19 testing platform using self-collected nasal swabs in an urgent care setting. *J Urgent Care Med.* 2020;14(11):12-13.

## Introduction

The Abbott ID NOW Point of Care (POC) system is designed to perform rapid on-site nucleic acid amplification polymerase chain reaction (PCR) testing. However, recent publications from academic settings have reported concerning and varying false negative (FN) rates with this diagnostic test.<sup>1-4</sup> It is unknown if the high FN rate is a function of the POC machine, the training of the clinical staff, or the specimen collection type. We therefore undertook a validation study in a “real world” community setting of symptomatic patients presenting to urgent care clinics or testing tents. Each patient had two samples collected: one for POC testing (either nasopharyngeal [NP] or nasal) and one NP specimen to run on a high-throughput diagnostic test in a commercial reference laboratory on their PCR platform (LabCorp or Quest). Samples were collected at the same time on the same patients to compare FN rates of the Abbott POC machine with traditional PCR platforms.

## Methods

Though the Food and Drug Administration classified the Abbott ID NOW as a CLIA-waved test, we opted for higher standards and elected to use CLIA-defined moderate complexity standards for quality control, quality

assurance, proficiency testing, and training of personnel. In addition, validation testing of known positive and known negative samples from PCR NP swabs was completed before deployment of the Abbott POC machines.

After initial validation and training, the machines were deployed in all 14 of our urgent care locations and three adjacent testing tents. All symptomatic patients who presented to urgent care or the testing tents who met local testing criteria were included in the study.

A self-collected nasal swab was obtained from supervised urgent care patients. Both nares were swabbed without use of a viral transport medium (VTM). If the POC test was negative, an NP swab was obtained by trained clinical staff, placed in VTM, and sent to a reference laboratory for traditional laboratory-based PCR testing.

This protocol allowed us to evaluate the false negative rates of the Abbott POC machine compared to traditional PCR testing, as well as to the FN rates of nasal swab when compared to NP swab collection methods.

## Results

In the first stage of validation, before deploying the POC tests to our centers, 10 known PCR-positive patient specimens from hospital-based NP swabs, and 10 known negative patient specimens from hospital-based NP swabs were tested. All 20 POC results matched the laboratory PCR results.

In the second stage, the POC assay was tested with 10 separately diluted known positive PCR patient speci-



Platforms	Known NP PCR positive samples		Known NP PCR negative sample
	Diluted to 1:500	Diluted to 1:1000	Diluted to 1:1000
ABBOTT ID NOW	3/3 (100%)	6/6 (100%)	1/1 (100%)
BD Max	3/3 (100%)	5/6 (83.3%)*	1/1 (100%)
Cepheid GeneXpert	3/3 (100%)	6/6 (100%)	1/1 (100%)
QIAGEN QIAstat	3/3 (100%)	5/6 (83.3%)	1/1 (100%)

\*One sample had indeterminate result

mens including nine positive specimens and one negative specimen. Three other laboratory PCR platforms (BD Max, Cepheid GeneXpert, and QIAGEN QIAstat) were also subjected to the same dilution specimens for comparison. In both 1:600 and 1:1000 dilution specimens, the POC assay correctly detected the presence and absence of viral targets (see **Table 1**).

After validation, the POC machines were deployed into the urgent care locations. A total of 3,509 patients were tested using the POC in Medstar Health Urgent Care or testing tents in April and May 2020. Patient consent was obtained for treatment, but not for research purposes, as this testing was part of our internal testing protocol development and data were collected retrospectively for research purposes from chart and lab results review. Of these patients, 3,388 (97%) were included in the study; patients with invalid POC results (n=27) and those without concurrent PCR sent due to patient refusal (n=94) were excluded.

Compared to PCR, nasal POC specimens (n=2,523) demonstrated an FN rate of 13.5%, sensitivity of 86.5%, and NPV of 92.8%; in comparison, the NP POC specimens (n=865) demonstrated an FN rate of only 10.3%, sensitivity of 89.7%, and NPV of 96.5% (see **Table 2**). The difference between the FN rate of nasal vs NP POC testing was not statistically significant (p=0.2). Nasal POC did have a significantly lower NPV than NP POC (p=0.0007); however that could be due to significantly higher prevalence of virus in nasal than NP POC specimens (p<0.0001). Difference in prevalence between nasal and NP POC is likely due to variation in prevalence by location of testing sites, as our urgent care and tent locations span urban and suburban areas in Baltimore and Washington, DC. The tents had a healthier prescreened patient population that did not need a physician-facing visit.

## Discussion

The findings support the use of protocol-driven POC

	Nasal POC	NP POC	P value
True negative (TN)	1,603	641	N/A
False negative (FN)	124	23	N/A
True positive (TP)	796	201	N/A
NPV <sup>a</sup> = TN/(TN+FN)	92.8%	96.5%	0.0007
FOR <sup>a</sup> = 1-NPV	7.2%	3.5%	
FNR <sup>a</sup> = FN/(FN+TP)	13.5%	10.3%	0.1979
Sensitivity = 1-FNR	86.5%	89.7%	
FNR for two POC tests <sup>b</sup> = FNR * FNR	1.82%	1.1%	N/A

<sup>a</sup>NP POC vs nasal POC, Chi-square test  
<sup>b</sup>NPV: Negative predictive value; FNR: false negative rate; FOR=false omission rate  
<sup>c</sup>Hypothesized probability of false negative for repeat POC tests in subsequent days

testing of symptomatic patients using self-collected nasal swabs in real-world settings. Advantages include rapid turnaround time and conservation of limited NP swab supplies throughout the country.<sup>5</sup> However, the data also suggest that the quality of the sample, obtaining NP vs nasal, may favorably lower the POC FN rate if NP swabs are not constrained. When NP swabs are constrained, subsequent testing with a repeat nasal POC on consecutive days to further lower the FN rate may therefore be an ideal protocol for COVID-19 testing in the outpatient setting to allow for more rapid results. ■

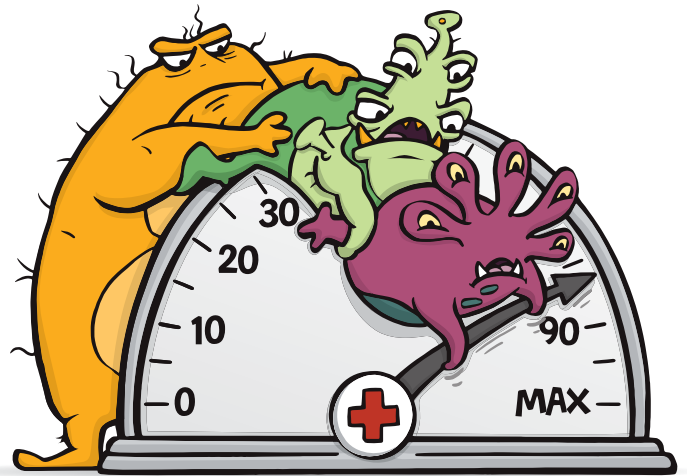
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**Syndromic Testing: The Right Test, The First Time.**

# A 41-Year-Old Woman with Multiple Complaints

**Urgent message:** The risk in not “doing the math” with a patient’s risk factors is obvious for that patient. However, urgent care providers and operators also run significant legal risk when patients with multiple complaints present and there’s a bad outcome—even if the most pressing complaint is impossible to discern.

MICHAEL B. WEINSTOCK, MD; DAVID A. FARCY, MD FAAEM, FACEP, FCCM; and RAMIN VEJDANI, DO

[This case was adapted from a chapter in the book *Bouncebacks! Critical Care* by Michael B. Weinstock, MD; Kevin Klauer, MD; and Scott Weingart, MD. The book is available from [www.anadem.com](http://www.anadem.com), [www.oha-cep.org](http://www.oha-cep.org), or [www.amazon.com](http://www.amazon.com).]

## The Patient’s Story

Stacy is a hard worker, at one point working three jobs: cleaning the credit union and Mr. Payroll during the day and working at UPS at night. According to her mother, “She never stopped working. She did whatever anybody needed her to do.”

At the age of 26, Stacy delivers a healthy baby girl, Celina. During the delivery, Stacy suffers a “diabetic stroke” and is told to have a tubal ligation. At this time, she is married to Leo, but the marriage ends badly and she is left to raise Celina on her own; Leo does not provide assistance. Though she does not have much money, Stacy is a wonderful mother, supporting her daughter’s interest in gymnastics and taking her to the beach. Through the years, Celina becomes her “best friend.”

In her early 30s Stacy starts dating a man named Robert. At one point, she walks upstairs after doing laundry and overhears Robert saying, “I don’t want the baby. You might as well do something with it. I don’t want it.” When confronted, he denies the conversation so Stacy calls the woman Robert had been speaking with back



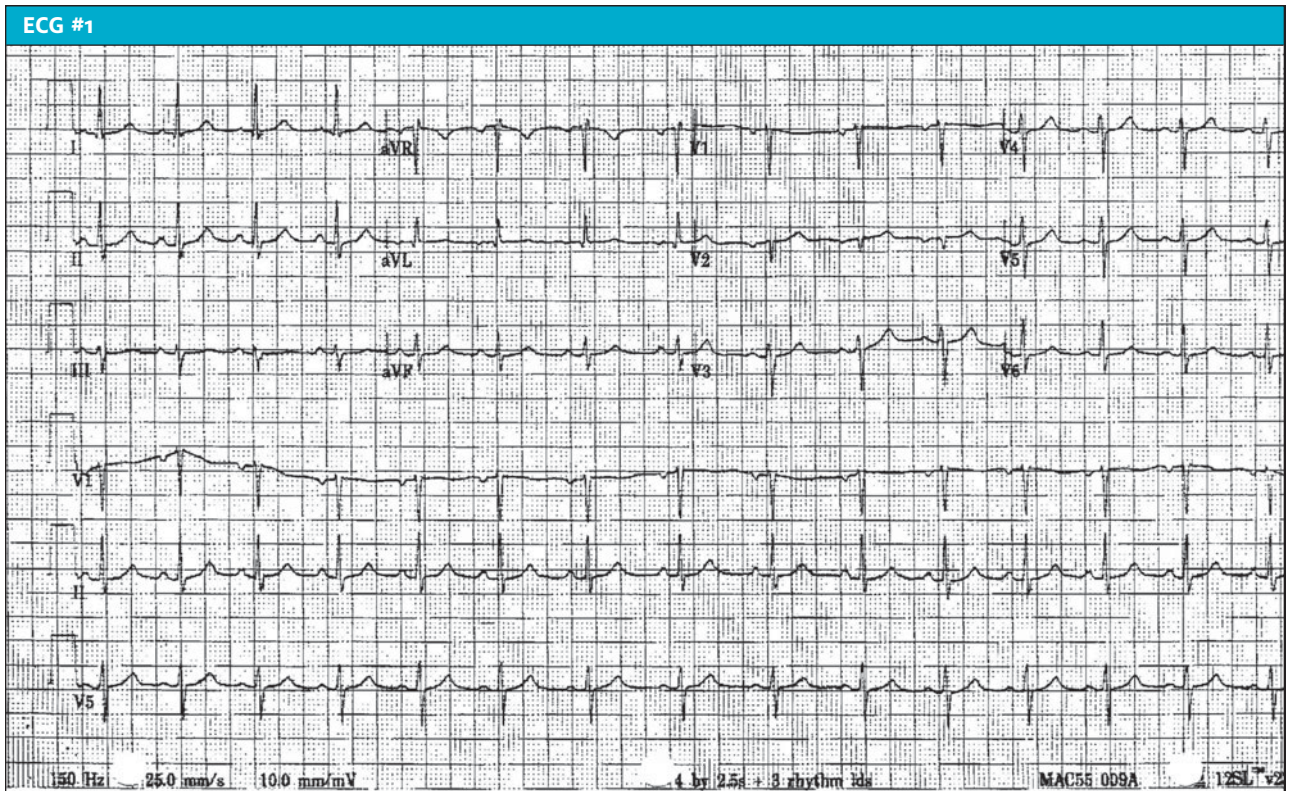
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and says, “I’ll take the baby. I’ll raise him as my own.” She borrows money for the adoption papers and brings the baby home from the hospital, calling him Matthew.

On October 2, Stacy calls her mother and tells her she is having pains in her chest. “Do you think its indigestion?” her mother asks.

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“No.” Stacy replies. “I’ve been taking something for indigestion and it’s not working.”  
 Stacy decides to be evaluated.

**41-Year-Old Woman with Chest Pain**

(What follows is the actual documentation, including spelling and punctuation errors.)

Vital Signs				
Time	Temp(F)	Rt	Pulse	Resp
18:28	97.9	O	97	20
Syst	Diast	O2%	Pain scale	
186	96	nl.	8/10	

CC (RN AT 18:13): Chest pain - pain from above waist to head, neck and arms

**NKDA**

PMH: HTN, CVA, DM  
 PSH: Choly  
 SH: Smoker  
 Meds: Glucophage, Avandia, Norvasc, Accupril – pt out of meds last 3 months

HPI (18:55 - MD note): Pt is a 46-year-old woman with chief complaint of chest pain for the last 1 day or so. Pain is a tightness across the chest and upper arms which is worsened by deep breaths. Radiates to the left arm. PMH of high blood pressure and diabetes. No nausea and vomiting, coughing blood, syncope, feeling of doom, shortness of breath, sweating and palpitations. Nursing notes reviewed. SH Smoker. FH: Hx cardiac disease after the age of 55

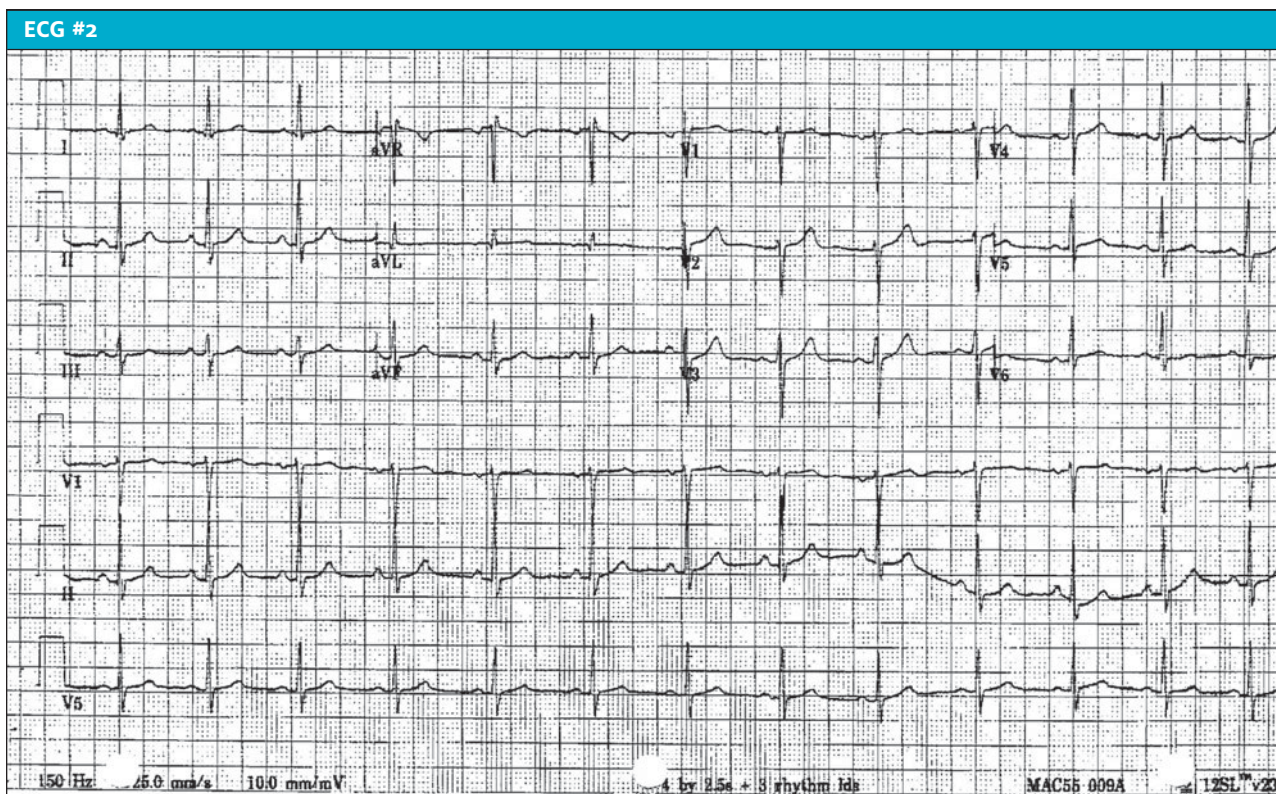
**PE**

General: A&OX3, appears very uncomfortable  
 Eyes: PERRL  
 CV: RRR without m/r/g. Normal heart sounds. Good capillary refill. No peripheral edema

Vital Signs				
Time	Temp(F)	Rt	Pulse	Resp
19:20			87	16
Syst	Diast	O2%	Pain scale	
		97		

Resp: No resp distress. Prolonged splinting and decreased air movement and wheezing.





Abd: Soft and NT throughout, without r/r/g  
 Back: No CVAT  
 Skin: Normal without petechiae, vesicles, erythema

CXR (19:11) - WNL. Fingerstick BS= 255

**ECG#1 @ 19:20**

Vent rate 89 bpm                      Normal sinus rhythm  
 PR interval 148 ms                  Septal infarct,  
 QRS duration 80 ms                  age undetermined  
 QT/QTc 368/447 ms                  Abnormal ECG  
 P-R-T axes 62 14 44

Vital Signs				
Time	Temp(F)	Rt	Pulse	Resp
20:25			71	16
<b>Syst</b>	<b>Diast</b>	<b>O2%</b>	<b>Pain scale</b>	
130	82	100	3/10	

Albuterol aerosol #1 (19:20)  
 Albuterol aerosol#2 (19:31)

**ECG#2 @ 20:25**

Vent rate 79 bpm                      Normal sinus rhythm

PR interval 148 ms                      Normal ECG  
 QRS duration 80 ms  
 QT/QTc 382/438 ms  
 P-R-T axes 66 33 56

**MDM/ED course:** "CXR and ECG's reviewed. Albuterol aerosol, captopril 25mg PO"

**DIAGNOSIS:** HTN, bronchospasm

**Condition:** Stable

**Disposition:** Home

**RN:** d/c home with driver. Pt states pain much better. Verbalizes understanding

**Discussion of the Initial Visit—Evaluation of Chest Pain, Medical Decision-Making, Documentation, and Patient Safety**

This seems a straightforward case of "typical" angina with risk factors that include diabetes (noncompliant), smoker, history of coagulopathy with TIA, and a potential positive family history. Certainly, a more thorough history and work-up could have been performed, as well as better documentation of the medical decision-making process. We

believe that the initial physician anchored on the diagnosis of “bronchospasm,” even though the patient did not have a history of asthma or COPD (though she is a smoker). There are five historical factors associated with acute coronary syndrome (ACS),<sup>1</sup> including:

- Exertional pain
- Radiation
- Diaphoresis
- Vomiting
- Pain similar to past episodes of ACS

### What is the patient’s ‘question’? What is the presentation’s ‘question’?

It is essential that we understand not only the patient’s question, beyond “Am I having a heart attack?” as evidenced here, but also what the patient’s *presentation* is asking.

In Stacy’s presentation, a wide differential remains, including not only the possibility of a “heart attack” but also pulmonary embolism (she has chest pain which is pleuritic; “...worsened by deep breaths”), as well as aortic dissection (she is at increased risk with her history of hypertension and we don’t know if the pain radiates to the back).

Do the plaintiff’s attorneys understand this also? Consider the opening statement at Stacy’s trial:

#### **Opening statement by plaintiff attorney**

*“Good morning, everybody. One of the major reasons people come to EDs in the U.S. is because of chest pain. Not all of it is fatal. And it’s not always easy to diagnose. And the rule in EDs is that you treat chest pain as a heart attack until you rule it out. That’s the rule. The evidence is going to show that when Stacy left the hospital with her friend Doneen, they were in shock. Doneen regrets to this day that she did not bar the door and say, “No, we’re not leaving. We’re not leaving.”*

### Back To The Case – The Documentation

What could have been done to keep our patient safer—and to decrease our own medical legal risk?

#### **1. Lack of correlation between chief complaint and final diagnosis**

Let’s start with the biggest problem with this evaluation—the final diagnosis of HTN, bronchospasm; this has no correlation with the presenting chief complaint (chest pain – pain from above waist to head, neck and arms). Bronchospasm typically presents with an intractable cough and wheezing, though as the bronchospasm worsens, an increased obstruction to air entry might limit the auscultation of audible wheezing sec-

ondary to lack of poor air exchange. The patient’s chief complaint is chest pain with a respiratory rate of 20 and normal oxygen saturation; a focused review of systems stated no shortness of breath and the physical exam showed “no respiratory distress. Prolonged splinting and decreased air movement and wheezing.”

In short, nothing in the history or physical exam supports a diagnosis of bronchospasm. There is no cough, accessory muscle use, tachypnea, history of asthma or COPD, or previous history of respiratory problems. The chart does point out chest pain: “Pain is a tightness across the chest and upper arms which is worsened by deep breaths. Radiates to the left arm.”

Is a physician’s gestalt good at predicting the diagnosis and outcome in patients with ACS? Unfortunately not, with multiple studies showing that gestalt alone had little to moderate diagnostic value compared to gestalt plus electrocardiogram (ECG) and troponin.<sup>1,2</sup>

#### **2. Poor history**

History taking is an art. We are asking questions not just to meet the billing standard, but to also show consideration of “worst first.” All nontraumatic chest pain patients need to be risk-stratified as either low or high risk. Differential in a 41-year-old woman with chest pain includes:

- Acute coronary syndrome (ACS)
- Pulmonary embolism (PE)
- Thoracic aortic dissection (TAD)
- Pneumothorax

Because there is essentially no medical decision making (MDM) section, we need to default to the history, exam, and evaluation to determine what this provider actually considered in the differential. Unfortunately, the chart points only to consideration of ACS (two ECGs were done). One could argue that pneumothorax was considered because a chest x-ray was ordered, though there was not a preliminary EP interpretation specifically addressing pneumothorax. It would have been nice to see an interpretation which stated that “there is no evidence of PTX or a widened mediastinum.”

#### **Do attorneys understand the importance of a good history? Consider this exchange:**

Cross examination of defendant physician by plaintiff attorney:

*Q. Now, in order to put the pieces of the puzzle together for what is causing chest pain, you need to get an accurate history, don’t you?*

*A. Yes, sir.*

*Q. You don’t just take the patient’s words for it. There are*



criteria for doctors to probe into what exactly the nature of the pain is, isn't that correct? Those questions should have been asked, correct?

A. Yes, sir, they typically would be asked.

Q. And the reason they need to be asked is because we're dealing with something that could be missed and you need as much information to put the puzzle together?

A. Yes, sir.

### 3. The ECG

Can an ECG aid in ruling out ACS? The initial ECG has a sensitivity of 20% to 60% for AMI, similar to flipping a coin.<sup>3</sup> If the ECG has ST-segment depressions >0.05 mV with or without T-wave inversions, sensitivity increases to about 75%.<sup>4</sup> Unfortunately, the 12-lead has geography limitation, leaving the inferior and posterior wall untraced. Our patient had two ECGs, but if there was sufficient concern for ACS, perhaps a troponin would have aided in the diagnosis, as well as additional data gathering, including risk factors.

### 4. Risk factors

Since gestalt combined with an ECG is not much help in ruling out ACS, what should we do? The Framingham study group looked at the risk of developing cardiovascular disease over 10 years. A patient with no risk factors does not eliminate the possibility of ACS.<sup>5,6</sup> However, one study showed that in patients <40 years of age with a very high-risk factor burden (4 to 5 risk factors), the likelihood of ACS was increased >20-fold.<sup>7</sup>

### Do attorneys know about the importance of obtaining risk factors?

The plaintiff's attorney did not leave anything to chance. Consider this exchange:

Plaintiff attorney: Q. Let's count the risk factors. One, diabetes, right?

Defendant physician: A. Yes, sir.

Q. Two, smoking, correct?

A. Yes, sir.

Q. Three, hypertension or blood pressure, correct?

A. Yes, sir.

Q. Four, stroke?

A. Yes, sir.

Q. Correct? Five, age over 40, correct?

A. Yes, sir.

Q. Six, family history?

A. Yes, sir.

Q. It's a bunch, isn't it?

A. Yes, sir.

### 5. Decision tools

The HEART score, originally developed in 2009 and validated in 2013, predicts a very low rate of a major adverse cardiac event (MACE) at 4-6 weeks for low-risk patients.<sup>5,6</sup> We do not have any indication that the HEART score or any other decision tool was considered—and in fact, without obtaining a troponin, it would have not been possible to calculate.

H – History

E – ECG

A – Age

R – Risk factors

T – Troponin

Additionally, a multicenter study by Weinstock, et al looked at over 45,000 chest pain patients with interpretable and nonischemic ECGs, nonconcerning vital signs, and two negative troponins, finding an exceedingly low rate of a clinically relevant adverse cardiac outcome (CRACE).<sup>8</sup> Our patient did not have any troponin testing done.

### 6. Poor documentation of medical decision-making

Historically, clinicians over-document the catastrophic case, thinking they may be involved in a lawsuit. However, it is rarely those cases that come back to haunt us; rather, it's the cursory evaluation and discharge. In our case, there is no MDM, just a statement: "CXR and ECGs reviewed. Albuterol aerosol, captopril 25 mg PO."

*Hard stop your MDM!*

In patients with diagnostic uncertainty about a potentially life-ending complaint (like ACS, PE, or TAD in this case), "hard stop" your MDM; prior to discharge, ensure that it has been discussed why serious life-threatening diagnoses are not occurring. If you find that there is not enough information to make this decision (as in this case), go back to the bedside and obtain additional data. Before the patient leaves, ask if they would be comfortable explaining your care to the patient's family or friends; if not, reassess and re-explain in the MDM.

If there is an adverse outcome, "experts" can argue at your disposition/trial, but not against your *thinking*; even if there is a bad outcome, your decision-making process is well-described and sound, which is defensible.

Of note, the considerations of PE (in a patient with pleuritic pain who is over the age of 35 and who is a smoker on oral contraceptives) and TAD (in a patient where there is no specific exclusion of pain radiating to the back) have still not been appropriately explored or

excluded. Unfortunately, during the initial visit, the physician seems to have come to premature closure and anchored on a diagnosis of bronchospasm.<sup>9</sup>

### 7. Women with ACS present differently than men

This patient's age and medical history alone give her four significant risk factors, which puts her in a high-risk category. To add to the complexity, women experience significant differences in their presentation of ACS, leading to higher morbidity and delay in diagnosis of ischemic heart disease compared to men.<sup>10-12</sup>

### 8. Tips to evaluating a multiple-complaint patient

Unfortunately, multiple-complaint patients take longer, but it is essential to maintain an appropriate differential and ensure that our evaluation is logical. Instead of viewing the patient as difficult, try to determine their underlying reason for presentation. This approach will provide insight into their *main* concern.

### Bringing It All Together

Now let's go back and look at our patient, who had a chief complaint and many associated complaints. There was a poorly obtained history and an inadequate attempt to correlate the complaints into a cohesive story. Just considering her history of noncompliance puts her in a higher risk category. (Spoiler alert: the *actual* diagnosis was *not* "HTN, bronchospasm." Something big was missed. At trial, the plaintiff's attorney focused on inadequate gathering of data, specifically risk factors, and lack of consideration of life-threatening causes of chest pain.

### The Story Continues (extracted from trial testimony)

When Stacy returns home from the hospital, she tells her daughter she is feeling better. As everything seems fine, Celina goes to bed around 10 PM, only to be awoken around 2 AM by the sounds of her mother moving around the kitchen. According to Celina, "I went in there to see what was going on and [my mom] went outside to smoke a cigarette, so I went out there and sat [on the front steps] with her. She told me that she loved me and that everything was going to be OK and she was sorry if she ever did anything to hurt me or my brother.

"I told her I loved her, too and that it was OK. She gave me a hug and kiss and then I went back to bed.

"[The next thing I remember is] my mother's boyfriend Steve waking me up screaming and crying because my mom is on the floor and she is not talking to him. I called 911 and they told me to give CPR. I tried

it but nothing helped."

### ED Return (early the next morning)

CC: Cardiac arrest

EMS (summary-time of arrival on scene 04:21; verbatim from handwritten notes): 41 yo F apneic and pulseless according to family. Pt was up making coffee and collapsed. They stated she has been c/o chest pain for a couple of days. Pt unresponsive CPR and BVM assist with 100% O<sub>2</sub>. ET tube 7.5 25cm @ lip. Tube secured. BX X4 clear. IV. Epi 1:10000 1mg ivp. Pt rhythm changed to v-fib. Pt shocked 200 biphasic. Vasopressin 40 units IVP. Rhythm still v-fib. 300J shock biphasic. Amiodarone 300mg ivp. No change. CPR continues. Pt transported to hospital without incident or change. Report given to staff. Pt placed in hospital bed.

### ED Documentation

HPI (physician): Presents via EMS w witnessed arrest by husband. Pt had complained of chest pain prior to arrival. EMS information reviewed. Pt is unable to give additional information secondary to medical condition of cardiac arrest

### PE

GENERAL: Unresponsive, CPR in progress  
EYES: Pupils dilated and unresponsive  
Neck: Normal  
CV: No spontaneous heart tones  
LUNGS: Clear with equal breath sounds with bagging  
ABD: Slightly distended  
Ext: Normal

### ED course

EMS arrival on scene 04:21  
Pt arrives in ED @ 0500 in full arrest

### ED Code Sheet (verbatim from the actual ED document)

EMS stated they arrived and found pt pulseless and apneic @0421.

EMS arrived at ER at 0500.

0500 Arrival and attached to cardiac monitor

BS checked and confirmed

ETT 7.5 @ 22cm lip

0502 CPR continued

Epi 1mg

Atropine 1mg

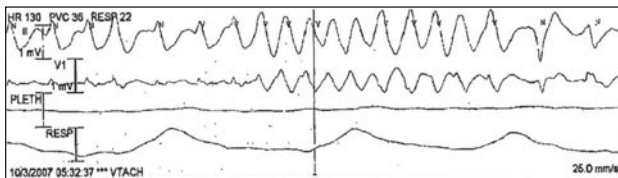
Bicarbonate 50mEq

0508 Shock, 150J

PEA, CPR continued  
 Lidocaine 100mg  
 0509 Epi 1mg  
 CPR held, Wide complex Bradycardia  
 2<sup>nd</sup> IV initiated at R AC (20ga), blood drawn  
 Dopamine @ 20mcg/kg/min (at weight – 80 kg  
 BG – 343

### **The resus continues:**

0519 – Pulse check reveals no pulses. CPR is continued  
 0520 – Vfib  
 Shock 150J  
 Atropine 1mg  
 0522 – CPR held – no pulse  
 0523 – CPR started  
 Epi 1mg IVP  
 Shock 150J  
 0526 – Epi 1mg IPV  
 0527 – Bicarbonate 50mEq  
 0531 – CPR held, pulses present.  
 0532 - Rhythm strip shows:



0534 –  
 Shock 150J  
 Shock 150J  
 Wide complex sinus rhythm – heart rate is 143. Pulse ox 72%  
 0537 – Amiodarone 150mg  
 Shock 150J  
 0538 – Levophed 4mg/250ml wide open. Heart rate is 90. Sat is 72%. Summary: Dopamine and levophed are running  
 0539 - Pulse check = no pulses. CPR is continued  
 0540 – V fib  
 Shock 150J  
 Shock 150J  
 0542 – Pt apneic and pulseless  
 0543 – Code called  
 0619 - Numerous family and friends arrive and are taken into the room by the chaplain to view the body

### **An autopsy reveals:**

Acute myocardial infarction  
 Severe atherosclerotic involvement of the circumflex and the right coronary artery

Patchy fibrosis of the myocardium  
 Medical history of hypertension, diabetes mellitus and prior cerebrovascular accident  
 CAUSE OF DEATH: Acute myocardial infarction due to severe atherosclerotic heart disease.

### **The Legal**

Shortly after Stacy's untimely death, a malpractice action was entered, proceeding to discovery, depositions, and eventually a trial, some of which was reproduced here. Allegations of malpractice are entered not only against the initial treating physician, but against the hospital and nursing staff. As it turns out, the hospital had recently rewritten its procedure for triage with a recommendation to assign a triage category of 2 for chest pain patients, but Stacy had only been assigned a category of 3, in direct contradiction of the hospital's own policy.

### **The Plaintiff Strategy**

Stacy collapsed at her home just over 7 hours after ED discharge. The pathologist who performed the autopsy testified that Stacy had severe atherosclerosis of the circumflex coronary artery and the right coronary artery. The left anterior descending artery had moderate atherosclerosis. A discolored region along the lateral side of the left ventricle indicated an acute MI.

The plaintiff's expert on emergency medicine testified that the hospital's nurses contributed to Stacy's death, partly because they assigned an incorrect triage category. They further suggested that the proper treatment for unstable angina is to first make the diagnosis by assessing myocardial function, performing a cardiac perfusion study, or taking the patient directly to cardiac catheterization or CT angiography. Based on these findings, a decision would be made as to angioplasty and stenting or a bypass. The expert did not believe that either the doctor or the nurses intentionally harmed Stacy, but Stacy presented with symptoms that were very consistent with unstable angina and myocardial infarction. In his opinion, with her significant risk factors of hypertension, smoking, and diabetes, the possibilities of myocardial infarction and unstable angina were not adequately evaluated.

### **The Defense Strategy**

Though there was a delay in obtaining the ECG, there was no reason to believe that doing so earlier would have changed the management. The chart reflects the presence of multiple risk factors for coronary artery disease; however, Stacy exhibited no associated symptoms—nausea and vomiting, coughing blood, syncope,



feeling of doom, shortness of breath, sweating, palpitations. A physical examination of her cardiovascular system—regular rate/rhythm, no murmur, no gallop, no friction rub, pulses full/equal—presented in normal range. She was not cyanotic, diaphoretic, or pallid. There were two “ECGs with a whole day of pain, not having acute changes.” Because his impression was that Stacy’s chest pain was of non-cardiac origin, the doctor did not order cardiac enzyme tests. According to the doctor, the level 3 triage assigned to Stacy provided more than enough time for him to make the correct decision. The discharge nurse told Stacy to return to the emergency room if the pain returned or worsened. The doctor instructed Stacy to set up an appointment the following day with her doctor to address her high blood pressure. The discharge instructions informed Stacy to call sooner if she thought it was necessary, and to return immediately if her symptoms worsened.

### The Trial: An Unexpected Twist

Some of the trial testimony was detailed previously, but sometimes there is an unexpected twist! When the plaintiff attorney gets the defendant physician on the stand, he tries to shame him into admitting he is wrong and that his care led to the death of the patient:

#### Plaintiff attorney examination of defendant physician:

Q. Wouldn’t it be nice to learn from a traumatic experience? Wouldn’t it be nice to learn from somebody’s death and be willing to say, “You know what? Maybe let’s go back and retrace our steps. Do we want this to happen again?”

A. No sir, I think about this every day, I do not want it to happen again. This is very emotional for me. Do you know why I am a doctor? When I was 16...

Q. Your honor, can I have the witness instructed to...

A. I’m answering your question

Q. Your honor, can I have the witness instructed to...

A. It’s important for me to let this out. You asked me a question.

Q. Your honor...

#### The court:

Just a minute everybody, listen very carefully. Doctor, you will have a full opportunity to give your side of the story when counsel questions you. At the juncture, please answer the plaintiff’s questions. I understand it’s emotional for you and you want the jury to understand. You will have your opportunity, at this juncture, simply answer his question.

#### Defense attorney examination of defendant physician:

Q. Doctor, you’ve been on the stand for a few hours. While you were giving testimony a few moments ago, you started to say something about why you became a physician and the plaintiff counsel stopped you. Would you like to share that with the jury?

A. Yes sir, he had asked if I understand what they’re going through. When I was 16 I took a chemistry test and the secretary came and told me, “You’re to go right home.” I drove home. My mother had died of a heart attack at age 42. I understand what they’re going through. This is a horrendous case for me. When they subpoenaed the documents, I mean, I literally sat down and sobbed, that—that—that I—all of those risk factors and everything is on there. And if the nurses misriaged it, it’s my job to do that. And even there is enough information there, that I missed this. I don’t know how I missed this. But I understand very well what they’re going through. I go through it every day, I think about this case because it’s almost an ironic mirror image of what happened. My mom had had some chest pains. Her doctor thought she was just an anxious housewife that drank too much sherry and it turns out she dropped dead of a heart attack at 42. So I’m very much aware of what they’re going through. This is a very emotional case. And, again, I’m—I’m sorry that I am reacting this way, but this is—I understand what they’re going through

Q. Thank you for sharing that, doctor.

What follows next is truly astounding. The physician, besieged by genuine guilt and self-doubt, admits that he was wrong. One a side note, there were two legal actions: one against the physician, and the other against the hospital. Read on.

#### Defense attorney examination of defendant physician:

Q. You know what I’m getting at. At the hospital, worst-case scenario, her chances are tremendously better than in a trailer park? You checked that she was stable when she left the hospital, correct?

A. I appear to be in error about her being stable.

Q. Whoa. Wait, wait. What did you just say?

A. I appear to be in error in checking she’s stable. History has shown the fullness of time, she apparently had unstable angina, and so was not stable at discharge.

Q. So, you –

A. I was in error. I made a mistake. The nursing staff didn’t make a mistake. The hospital didn’t make a mistake. I made a mistake. I had a lady that had many risk factors. I thought

*I had answered her complaint with her BP and her bronchospasm and the two EKGs that didn't have evolving change. I thought she was stable. I was wrong. I failed her.*

### Trial Outcome

Jury sides with plaintiff. According to the newspaper report, “The jury hit the hospital with a \$1.4 million verdict Thursday, concluding that the hospital nurses were negligent in their treatment of the late Stacy.” The hospital appeals, as in Texas there is a very high standard of malpractice saying the physician’s actions need to be “Willful and Wanton.”

### Vote On Appeal

“We hold that the evidence of deviation from the standard of care by nursing staff is legally insufficient to support the jury’s finding that the willful and wanton negligence of the hospital was a proximate cause of Stacy’s death,” the opinion states. “Accordingly, we reverse the trial court’s judgment and render a take-nothing judgment.”

### Take-Home Points, Medical and Legal

The approach to finding negligence with the initial doctor and hospital is simple, as our patient was a walking disaster. First, there is no relationship in the documentation between the chief complaint and the diagnosis; this is a mountain which is difficult to climb. Second, she is high-risk with multiple risk factors. Third, the ECG was *not normal*. Exactly when her infarct took place is difficult to determine, but considering all factors, this woman should be considered to have ACS. Confusing a jury with whether she should have been a category 2 or a category 3 is useless. She had a concerning presentation; that’s enough! The triage category would not have changed the work-up. But the larger picture is clear. She has just about every risk factor, and we do not have another explanation for her chest pain.

### Defending the Physician(s)

There is no question that being a defense expert for the first treating physician would be extremely difficult. Juries like cases which are simple and easy to understand. They don’t want to have to balance multiple people who have made multiple errors.

### Hospital Liability

It is interesting to note that the 9<sup>th</sup> Circuit Court of appeals found the evidence legally insufficient for juries to find against the hospital. This usually means the hos-

pital personnel—ie, the nurses. Although the initial verdict included everyone, the court was essentially also focused on the first visit. It is also interesting that the initial EM doctor settled for \$150,000, while the hospital opted to take its chances in court. The attorney for the initial physician was very wise. The fact that the initial judgement was reduced from \$1.2 million to \$330,000 does say something about the legal system. It is also noted that the 9<sup>th</sup> Circuit Court issued an opinion finding in favor of the hospital, saying, “We hold the evidence of deviation from the standard of care by nursing is legally insufficient to support the jury’s finding that willful and wanton negligence of the hospital was a proximate cause of this death.” The court therefore gave to the hospital essentially a “take nothing” judgement, meaning they got themselves out of the case.

### Was It Fair?

The “willful and wanton” negligence, now the standard in the state of Texas, certainly had an impact on the results. Instead of coming away with \$1.4 million, the patient’s family comes away with \$150,000, a small amount to provide for parentless children, especially after attorney fees are deducted. Fairness is difficult to judge. ■

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## ABSTRACTS IN URGENT CARE

- Seasoned Eyes and ECGs
- Comparing ACS Decision Tools
- Does TMACS Stack Up?
- Cluing Patients in on Chest Pain
- Gender Differences in Chest Pain Assessment
- Duration of Chest Pain in Diagnosing MI

■ IVAN KOAY, MBChB, FRNZCUC, MD

### When It Comes to Reading ECGs, Experience Counts

**Key Point:** Advanced practice practitioners (APP) in this study had a level of skill in ECG interpretation equal to first-year EM attendings. These skills could be utilized, potentially, as screening pathways to improve clinical flow of patients in both emergency departments and urgent care facilities.

**Citation:** Hoang A, Singh A, Singh A. Comparing physicians and experienced advanced practice practitioners on the interpretation of electrocardiograms in the emergency department. *Am J Emerg Med.* 2020;50(7):56757(20)30047-4.

**Relevance:** There is an increasing number of APPs (physician assistants and nurse practitioners) who provide healthcare in a variety of urgent care centers and emergency departments. This paper investigates the accuracy of interpretation of electrocardiograms by emergency department attendings, residents, and APPs.

**Summary:** The authors identified 36 ECGs from previous patients, of whom 24 had a culprit lesion noted on cardiac catheterization. These ECGs were analyzed by ED physicians of various years' experience, from attendings to residents and advanced practitioners. The study found that accuracy in interpreting ECGs improved with increasing years of experience—attendings better at accurately identifying STEMI when compared to junior residents in the emergency program. The APPs in the study with 10 years of experience had interpretation skills equivalent to fourth- and fifth-year residents/first-year attendings.

**Limitations:** This study was limited by small sample size in a single center. In centers with less experienced APPs, there may

be differing results in the interpretation of ECGs. ■

### How Do ACS Clinical Decision Rules Stack Up?

**Key Point:** All the decision tools used in this study were effective in ruling out AMI/ACS in >90% of subjects. T-MACS appears to be the more sensitive tool for use in ruling out AMI in patients presenting with chest pain, while EDACS was the most efficient tool to allow early discharge. Interestingly, the HEART score, which is perhaps the most widely used, was the least sensitive.

**Citation:** Body R, Morris N, Reynard C, Collinson PO. Comparison of four decision aids for the early diagnosis of acute coronary syndromes in the emergency department. *Emerg Med J.* 2020;37(1):8–13.

**Relevance:** There are a variety of risk-stratifying tools to help with the decision-making process for patients presenting with acute chest pain to UC and the ED. This paper compares the accuracy of four commonly used decision tools. Having a reliable risk-stratifying tool helps in the decision-making process when assessing patients presenting with chest pain.

**Summary:** The authors directly compared four presently available and frequently used clinical decision tools for chest pain risk stratification—TMACS (Troponin-only Manchester Acute Coronary Syndromes), HEART (History, ECG, Age, Risk factors, Troponin), TIMI (Thrombolysis in Myocardial Infarction) and EDACS (Emergency Department Assessment of Chest Pain). This was a multicentered study looking at 999 patients assessed in emergency departments and using the four tools to rule out acute myocardial infarction (AMI) in them. Results showed that the TMACS tool was the most accurate with the ability to rule out AMI in 99.2% of patients and the HEART the least accurate with a rule out rate 91.8% of patient. EDACS was the most efficient tool used to discharge patients from the emergency department.

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*“The findings suggest that in rural areas and centers where laboratory testing is not available, POC testing is suitable for risk stratification of very-low-risk patients with chest pain using the T-MACS tool.”*

**Limitations:** There were large numbers of exclusions from the study due to missing data, particularly in the patients who were stratified with the HEART scoring tool. The authors state that these omissions did not invalidate the data when performing the comparisons. ■

### Assessing T-MACS as an Aid in Assessing Low-Risk Chest Pain Patients

**Key Point:** *The T-MACS POC algorithm may be a useful tool in identifying low-risk chest pain patients suitable for early discharge.*

**Citation:** Alghamdi A, Reynard C, Morris N, et al. Diagnostic accuracy of the troponin-only Manchester acute coronary syndromes (T-MACS) decision aid with a point-of-care cardiac troponin assay. *Emerg Med J.* 2020;37(4):223–228.

**Relevance:** Point-of-care (POC) testing can be useful as an aid for risk stratification where formal laboratory assays may not be available.

**Summary:** The authors used the Troponin-Only Manchester Acute Coronary Syndrome (T-MACS) decision tool for chest pain risk stratification. In this study, 396 adults >18 years were enrolled (n=396) and stratified as very-low, low-, moderate-, or high-risk. POC testing was done for the very-low and low-risk patients, and serial troponins for the moderate- and high-risk patients deemed to require more investigation. Using the T-MACS system, the study was able to risk stratify 35.4% of patients to be suitable for early discharge. When serial laboratory troponin testing was done at 3 hours, the POC test performed equally as well as the laboratory test to allow for appropriate discharge to be performed safely. These findings suggest that in rural areas and centers where laboratory testing is not available, POC testing is suitable for risk stratification of very-low-risk patients with chest pain using the T-MACS tool. The algorithm accurately rules out patients for ACS in 99.2% of cases.

**Limitations:** The study had small numbers enrolled, which the authors acknowledge. The study used a specific POC testing kit. There is no discussion about the reliability of other POC kits in the marketplace. ■

### Keep Patients in the Loop About How We Evaluate Chest Pain

**Key point:** *Effective communication regarding pathways and results of testing is an important factor in reassuring patients with chest pain.*

**Citation:** Ferry AV, Strachan FE, Steward SD, et al. Exploring patient experience of chest pain before and after implementation of an early rule-out pathway for myocardial infarction: a qualitative study. *Ann Emerg Med.* 2020;75(4):502–513.

**Relevance:** Rapid rule-out pathways have been established in EDs to enable safe discharge for patients deemed low risk for ACS. This paper assesses the perceptions of patients regarding the implementation of such pathways. Understanding patients’ perceptions enables better communication between clinicians and patients.

**Summary:** This study was a subset study of a larger prospective investigation of an early rule-out pathway in treating patients presenting with chest pain. The authors recruited patients from a wide age range within the larger study. These patients were interviewed 1 week after discharge. Common threads emerged from these interviews:

- Patients rarely presented to the ED without having already had contact with another healthcare provider. This made the patient believe that their presentation was serious.
- There was a disparity between the clinician’s interpretation of the troponin results and the patient’s illness experience. Some patients had ongoing symptoms at the time of the interviews.
- Reassurance about negative testing was better received by the patient if an alternative diagnosis was offered to explain their symptoms.
- There was frustration in some participants about the need for overnight observation, repeat testing, and recounting history to multiple clinicians.
- Participants used the presentation to the ED as an opportunity to consider their future heart health.

**Limitations:** Patients sampled in this study were from a single center in Scotland and may not represent patients from diverse ethnic populations and differing cultures. Patients’ previous ill-

*“Gender bias exists when treating patients presenting with atraumatic chest pain. This should be considered when evaluating all patients.”*

*“The ability to predict patients having MI or MACE improves the stratification of patients presenting to urgent care with chest pains.”*

ness experiences were not taken into consideration by the authors. ■

**Does Patient Gender Affect Chest Pain Risk Assessment?**

*Key point: Gender bias exists when treating patients presenting with atraumatic chest pain. This should be considered when evaluating all patients.*

**Citation:** Mnatzaganian G, Hiller JE, Braitbarg G, et al. Sex disparities in the assessment and outcomes of chest pain presentations in emergency departments. *Heart*. 2020;106(2):111–118.

**Relevance:** This study sought to determine if there is gender bias in the early management and decision making for female patients presenting to EDs with nontraumatic chest pain. It has been previously shown that women are treated differently than men with similar medical presentations.

**Summary:** This was a 5-year retrospective study looking at presentations of chest pain at three metropolitan emergency rooms in Melbourne, Australia. The authors found that women were more likely to have longer wait times in the ED, less likely to be triaged as urgent for medical review, less likely to have an urgent triage category by the triage nurse, less likely to be prioritized over men for ICU and CCU admissions, less likely to have troponin testing, and less likely to be reviewed by a physician within 1 hour when compared with men. This could be surprising to some in light of the fact that 90% of ED nurses in the study were female. Greater awareness of gender bias is needed when dealing with female patients presenting with nontraumatic chest pain.

**Limitations:** There were no data available concerning subsequent management of patients once admitted to hospital or discharged to the community. This paper represents the attitudes of staff in an Australian city, which may not be similar in other areas of the world. ■

**Duration of Chest Pain and the Risk for ACS**

*Key point: There are many different symptoms that lead to a diagnosis of ACS and MACE, especially in the elderly population. Vigilance is needed when assessing patients with chest pain. Chest pain lasting <1 minute or >24 hours is unlikely to be due to AMI.*

**Citation:** Zitek T, Chen E, Gonzalez-Ibarra A, Wire J. The association of chest pain duration and other historical features with major adverse cardiac events. *Am J Emerg Med*. 2020;38(7):1377–1383.

**Relevance:** History forms a crucial part of the assessment for patients with chest pain. This study investigates the relevance of duration of chest pain in the diagnosis of myocardial infarction. It also aims to determine if other clinical factors could predict whether patients were having a myocardial infarction (MI) or suffering from other major adverse cardiac events (MACE) within 6 weeks. The ability to predict patients having MI or MACE improves the stratification of patients presenting to urgent care with chest pains.

**Summary:** This was a single-centered, prospective cohort study to investigate whether the duration of chest pain had any relevance to the diagnosis of AMI in patients presenting to the ED. The patients enrolled were asked to describe the symptoms that led to the ED presentation. The symptoms noted were variable and included pain lasting less than 1 min, pain lasting more than 1 hour, pain radiating to back, left and right shoulders, arms, abdomen, neck and throat; describing pressure, sharpness, tightness, pins and needles, tingling; presence of diaphoresis, nausea, vomiting, light-headedness, and cough. The authors found that pain lasting <1 min or >1 hour were unlikely to represent ACS.

**Limitations:** This was a single-center study that may not be reproducible elsewhere. The participants were highly selected and some types of chest pain (eg, pleuritic) were not included in the study. The authors also conceded that some patients presenting with ACS may not have symptoms of chest pain. ■

**Symptoms Leading Patients to Visit the ED:**

- Pain lasting less than 1 min
- Pain lasting more than 1 hour
- Pain radiating to back, left, and right shoulders, arms, abdomen, neck, and throat
- Pressure, sharpness, tightness, pins and needles, tingling
- Presence of diaphoresis, nausea, vomiting, light-headedness, and cough





# Does the OSHA General Duty Clause Encompass Psychological or Emotional Injury?

**Urgent message:** Despite tort law and emerging workplace policies validating how sexual harassment, workplace bullying, and toxic gossip can lead to emotional and psychological harm, currently the OSHA General Duty Clause imposes a responsibility only for employers to provide a workplace free of “death and serious physical injury.”

ALAN A. AYERS, MBA, MAcc

The OSHA General Duty Clause, Section 5(a)(1) of the Occupational Safety and Health Act,<sup>1</sup> states that an employer must provide each of its employees with a workplace that’s free from recognized hazards that are causing or are likely to cause death or serious physical harm.<sup>2</sup>

In this article, we examine whether the OSHA General Duty Clause includes protections for emotional or psychological harm caused in employment. Does the OSHA General Duty Clause require employers to assess, identify, and mitigate risks that could cause psychological or emotional injury (in contrast to physical injury), with such factors as workplace bullying, sexual harassment, toxic gossip contributing directly to conditions such as depression and PTSD?

## General Duty Provisions

The phrase “serious physical harm” is essential to this article.

The general duty provision can be used by OSHA only in situations where there’s no standard that applies to the particular hazard, and the employer has its own employees exposed to the alleged hazard.<sup>3</sup> What is not clear is whether the OSHA General Duty Clause covers psychological or emotional injury as hazards that are causing or likely to cause death or serious physical harm.

In order for OSHA to prove a General Duty Clause violation,<sup>4-6</sup> each of these elements are necessary:



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1. The employer failed to render its workplace free of a hazard.
2. The hazard was recognized either by the cited employer or generally within the employer’s industry.<sup>7</sup>
3. The hazard was causing or was likely to cause death or serious physical harm.

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### Occupational Safety & Health Administration Act of 1970

#### Section 5. Duties

- (a) Each employer—
- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
  - (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

Source: United States Department of Labor. Available at: [https://www.osha.gov/laws-regs/oshact/section\\_5](https://www.osha.gov/laws-regs/oshact/section_5). Accessed August 16, 2020.

*“To determine if an individual poses a direct threat, the trial court should evaluate the duration of the risk; the nature and severity of the potential harm; the likelihood that the potential harm will occur; and the imminence of the potential harm.”*

4. There was a feasible means by which the employer could have eliminated or materially reduced the hazard.<sup>8-10</sup>

In addition, any hazard for which a Section 5(a)(1) violation is issued must be reasonably foreseeable.<sup>8-10</sup>

#### What Is Psychological or Emotional Abuse?

Emotional abuse can be defined as “any act including confinement, isolation, verbal assault, humiliation, intimidation, infantilization, or any other treatment which may diminish the sense of identity, dignity, and self-worth.”<sup>11</sup> Emotional abuse is also known as *psychological abuse* or as *chronic verbal aggression*.

Employees who suffer from emotional abuse tend to have very low self-esteem, show personality changes (like becoming withdrawn), and may even become depressed, anxious, or suicidal.<sup>11</sup>

Emotional and physical injury can be intertwined. For example, an employee can have physical symptoms or hurt themselves as a result of an emotional injury, such as job-related stress. An employee’s work can cause stomach issues and headaches, trouble sleeping and insomnia, chest pain, rapid heartbeat, and frequent

infections, as well as aches, pains, and tense muscles—not to mention serious mental illness.<sup>12</sup>

In addition to these physical manifestations, research shows that the direct bottom-line costs associated with workplace emotional abuse include increased absenteeism, increased presenteeism, increased use of medical and disability plans, legal fees, severance payouts, and recruiting fees related to increased turnover.<sup>13</sup> One study put the annual employer cost at \$225 billion.<sup>13</sup>

#### The Application of the General Duty Clause to Psychological or Emotional Injury

OSHA has developed a policy entitled Enforcement Procedures and Scheduling for Occupational Exposure to Workplace Violence, which provides that an employee who has experienced acts of workplace violence, “or becomes aware of *threats, intimidation, or other indicators showing that the potential for violence in the workplace exists,*” would have cause to put his employer on notice of the risk of workplace violence.<sup>14</sup> OSHA recommends the implementation of a workplace violence prevention program combined with engineering controls, administrative controls, and training.<sup>15</sup>

It is this language—“threats, intimidation, or other indicators showing that the potential for violence in the workplace exists”—that may hold the key for including emotional and psychological injury. These signs can be verbal and nonphysical actions that cause psychological or emotional injury that can lead to physical damages. This may give rise to claims of liability for an employer’s responsibility to protect employees from emotional or psychological injury under the General Duty Clause.<sup>16</sup>

Mental health awareness has come a long way in our society,<sup>17</sup> as has the #MeToo movement in terms of shining the light on sexual harassment.<sup>18</sup>

In addition, employees have protections from hostile work environments with the Equal Employment Opportunity Commission.<sup>19</sup> Claims by agencies and individuals have brought the work environment under much closer scrutiny. It may be that soon courts include the causes of psychological or emotional injuries in the mandate of workplaces to be “free from recognized hazards” in the interpretation of the OSHA General Duty Clause.

While not directly under the OSHA General Duty Clause, the Sixth Circuit has established that “[a] direct threat means that there is ‘a significant risk of substantial harm to the health or safety of the individual or others that cannot be eliminated or reduced by reasonable accommodation.’”<sup>20</sup> The regulation states that to determine if an individual poses a direct threat, the trial court

should evaluate the following factors:

1. The duration of the risk
2. The nature and severity of the potential harm
3. The likelihood that the potential harm will occur
4. The imminence of the potential harm<sup>20</sup>

In addition, “the risk can only be considered when it poses a significant risk, ie, high probability of substantial harm; a speculative or remote risk is insufficient.”<sup>20</sup>

As a corollary to this approach, some courts have

*“There is a movement in some areas of tort liability to recognize psychological or emotional injury linked to physical harm or on its own.”*

adopted the “zone of danger” rule, which states that as a basis for tort of negligent infliction of emotional distress,<sup>21</sup> a person who is herself placed within the zone of danger created by the defendant’s negligence is not a bystander and may “recover for emotional distress and injuries caused by witnessing injuries negligently inflicted on another.”<sup>22</sup> This is a change from the longstanding rule that there can be no recovery for negligently inflicted mental suffering that is not traceable to a contemporaneous and direct physical injury.<sup>21</sup> If courts are abandoning the requirement that to be compensable, the emotional injury must be traceable to physical injury caused directly by defendant’s negligence, perhaps employment law will follow.

### Takeaway

The OSHA General Duty Clause states that an employer must provide each of its employees a workplace that’s free from recognized hazards that are causing or likely to cause death or serious physical harm. “Death or serious physical harm” is the limitation. However, there is a movement in other areas of tort liability to recognize both psychological or emotional injury linked to physical harm or on its own. This may help convince OSHA to update its standard. ■

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### Summary

- The OSHA General Duty Clause (Section 5(a)(1) of the Occupational Safety and Health Act) states that an employer must provide employees with a workplace that is free from recognized hazards that are causing or are likely to cause death or serious physical harm.
- In order to prove a violation of the OSHA General Duty Clause, a complainant must prove:
  - the employer failed to render its workplace free of hazard
  - the hazard was likely to cause death or serious harm
  - there was a feasible means by which the employer could have eliminated or materially reduced the hazard
- Employees who suffer from emotional abuse tend to have very low self-esteem and show personality changes such as becoming withdrawn. They may also be prone to depression and anxiety, with some even becoming suicidal.
- OSHA has developed a policy, Enforcement Procedures and Scheduling for Occupational Exposure to Workplace Violence, which explains that an employee who has experienced acts of workplace violence, “or becomes aware of *threats, intimidation, or other indicators showing that the potential for violence in the workplace exists,*” would have cause to put his employer on notice of the risk of workplace violence.

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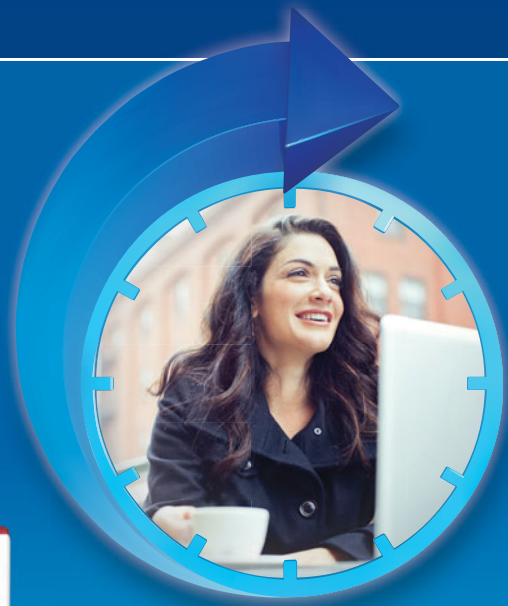
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# A Multicenter Study of the Rate of MACE in Chest Pain Patients with a Moderate HEART Risk Score Referred from Urgent Care for an Expedited Outpatient Cardiology Evaluation

SVETLANA BARBARASH, MD, FACC; DOLORES LEBRON-GALLAGHER, MS PA-C; HOLLIS JULSON, MD; and MICHAEL B. WEINSTOCK, MD

Abstract	
<p><b>Background:</b> The HEART Score is an effective method of risk-stratifying emergency department patients with chest pain. The rate of major adverse cardiovascular events (MACE) in patients with moderate HEART score referred from an urgent care center (UC) for an expedited outpatient cardiology evaluation is unknown.</p> <p><b>Purpose:</b> The primary outcome of this study was to examine the rate of MACE when patients with moderate HEART score were referred for expedited outpatient cardiology follow-up after evaluation in urgent care. The secondary outcome was to determine if there is a decrease in rate of ED transfer after this protocol was introduced.</p> <p><b>Methods:</b> A cross-sectional study including 133 patients who presented to one of five UCs with chest pain or an anginal equivalent and a HEART score of 4 to 6 (ie, moderate risk) was conducted by a multispecialty group in Las Vegas. A streamlined evaluation protocol to assess each HEART score component was adopted by all UC providers to facilitate an expedited outpatient cardiology follow-up as an alternative to referral to the ED. Data were collected from February 14, 2019 through January 14, 2020. The population was followed for 6 weeks with a primary endpoint of MACE determined by electronic medical record review and direct</p>	<p>phone contact with patients. Outcomes were confirmed in 91% of patients. Chest pain transfer data were compared between the final 6 months of 2018 and the final 6 months of 2019.</p> <p><b>Results:</b> Over the course of 11 months, 133 patients with a moderate risk HEART score were referred to outpatient cardiology in an expedited manner. The average age was 66 years, with 58% female and 42% male patients; 101 patients (76%) were seen within 3 days; 72 (54%) underwent stress testing; four (3%) had coronary CT angiogram; and four (3%) received an invasive coronary angiogram. Four patients were found to have MACE, including one with non-ST-elevation myocardial infarction (nSTEMI) and subsequent coronary stent, two who were found to have obstructive disease after coronary angiography with subsequent coronary artery bypass graft (CABG), and one who had an abnormal stress test and subsequent CABG. No deaths were identified. The rate of referral to the ED declined by 34%.</p> <p><b>Conclusions:</b> Patients with a moderate risk HEART score referred from UC for an expedited outpatient cardiology evaluation had a low rate of MACE/coronary intervention, with no deaths. There was also a significant decrease in the rate of ED referrals.</p>

Citation: Barbarash S, Lebron-Gallagher D, Julson H, Weinstock MB. A multicenter study of the rate of MACE in chest pain patients with a moderate HEART

risk score referred from urgent care for an expedited outpatient cardiology evaluation. *J Urgent Care Med.* 2020;14(11):31-35.

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**Table 1. Composition of the HEART Score for Chest Pain Patients in the Emergency Room**

HEART Score for Chest Pain Patients	Score	Points
History	Highly suspicious	2
	Moderately suspicious	1
	Slightly suspicious	0
ECG	Significant ST depression	2
	Nonspecific repolarization disturbance	1
	Normal	0
Age	≤65 years	2
	45–65 years	1
	<45 years	0
Risk factors (ie, hypercholesterolemia, hypertension, diabetes mellitus, cigarette smoking, positive family history, obesity [BMI>30])	≥3 risk factors or history of atherosclerotic disease	2
	1 or 2 risk factors	1
	No risk factors known	0
Troponin	>2x normal	2
	1-2x normal	1
	≤normal limit	0
<b>Total</b>		

Adapted from: Six AJ, Backus BE, Kelder JC. Chest pain in the emergency room: value of the HEART score. *Neth Heart J*. 2008;16(6):191-196.

**Introduction**

The advent and validation of the HEART score have improved the disposition of low-risk patients (HEART score 0-3 [HEART being an acronym for history, ECG, age, risk factors, and troponin]) due to a low risk of a major adverse cardiac event (MACE), as defined by revascularization, MI, or death within 4-6 weeks.<sup>1,2</sup> In a study of over 2,000 patients in the Netherlands, Backus et al showed a 1.7% risk of MACE in those deemed low-risk,<sup>2</sup> though a recent analysis of North American patients has shown a lower rate of 0.8%.<sup>3</sup>

MACE outcomes for patients in the moderate-risk HEART category (score of 4-6) in the Netherlands were shown to be 17%,<sup>2</sup> with a recommendation of admission for further evaluation; however, less is known about the safety of an expedited outpatient evaluation. In 2018, the American College of Emergency Physicians (ACEP) for the first time published a practice guideline for patients seen in the ED with a negative evaluation for chest pain, recommending follow-up within 1-2 weeks, and an acceptable miss rate of a MACE of 1%-2%.<sup>4</sup>

The rate of MACE in patients with chest pain and a moderate risk HEART score presenting to an urgent care (UC) center is unknown. The primary outcome of this study is to examine the rate of MACE after a negative UC

evaluation, when this group is referred for an expedited outpatient follow-up within 3 days. The secondary outcome is to determine the change in ED referral rate after the protocol for expedited outpatient follow-up was introduced.

**The HEART Score**

The HEART score is a risk-stratification tool for assessing the likelihood that a patient with chest pain will experience a clinically important, irreversible cardiac event (ie, myocardial infarction, revascularization, or cardiac death). Each component is assigned a point value, depending on the extent of the abnormality. A total score between 0 and 3 represents a 2.5% risk for an event, while a score ≥7 carries a 72.7% risk.

**Methods**

A cross-sectional study including 133 consecutive patients who presented to one of five Las Vegas urgent care locations with chest pain or an anginal equivalent (eg, jaw or throat pain with exertion) and a HEART score between 4 and 6 between February 14, 2019 and January 14, 2020 was conducted. Patients under the age of 18 or those with positive troponin, paced rhythm, left bundle branch block, significant ST-segment deviation on electrocardiogram, escalating angina, or unstable vital signs were excluded.



Patients were seen by UC providers including physicians, most of whom were board-certified in Family Medicine, and advanced-practice providers (APPs), both physician assistants (PA) and nurse practitioners (NP). In cardiology follow-up, patients were seen by cardiologists (if new patients to the practice) or APPs (if established patients).

UC clinicians followed a predefined protocol with disposition recommendations for patients with an intermediate HEART risk score (4-6) to be scheduled for an expedited cardiology consultation within 3 days of discharge.

The cardiology department conducted appointments for these patients, scheduled directly by the UC staff. During the cardiology consultation, additional disposition decisions were made, including medical treatment, outpatient stress testing, echocardiography, coronary CT angiography, or a conventional coronary angiography.

The Thrombolysis in Myocardial Infarction (TIMI) score<sup>5</sup> protocol was used for risk stratification of patients presenting to UC with chest pain or angina equivalent, prior to institution of new HEART model in February 2019. Thus, the percentage of ED referral was compared between the times when each protocol was used.

**Results**

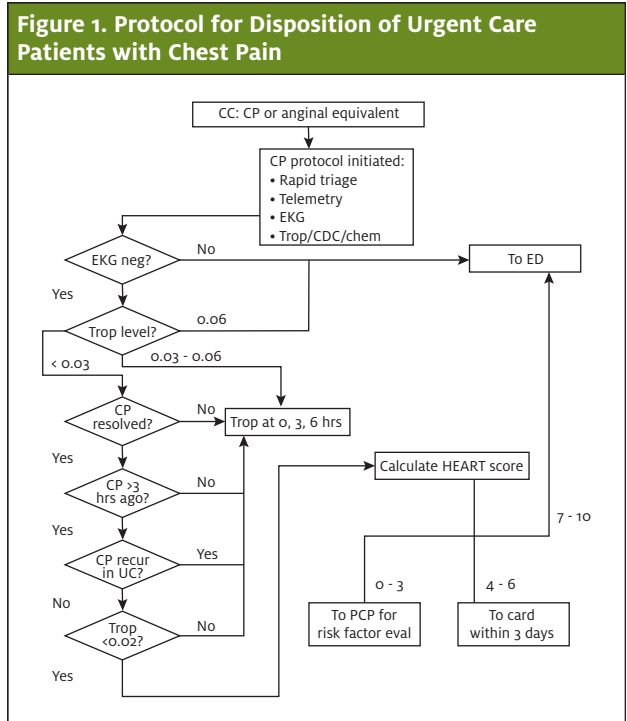
Data were collected from February 14, 2019 through January 14, 2020. The average age was 66; 77 subjects were female (58%) and 56 were male (42%). (See Table 2.) The population was followed with a primary endpoint of MACE at 6 weeks, determined by electronic medical record review and direct phone contact with patients.

**Outcomes**

Over the course of 11 months, 133 patients with a negative UC evaluation and a moderate-risk HEART score were referred for an expedited cardiology follow-up. Of the 133 patients referred for outpatient evaluation, 114 showed up for the appointment; of these, 101 (76%) were seen within 3 days. Of these patients, 72 (54%) underwent stress testing, four (3%) had coronary CT angiogram, and four (3%) received an invasive coronary angiogram.

Four patients were found to have a MACE. (See Table 3.) One patient had a non-ST-elevation myocardial infarction (nSTEMI) and subsequent coronary stent, two patients were found to have obstructive disease after coronary angiography with subsequent coronary artery bypass graft (CABG), and one patient had an abnormal stress test and subsequent CABG. No deaths were identified.

The secondary outcome was to determine if this protocol decreased referrals to the ED. Institution of the outpatient protocol during the 12 months after initiation



decreased the rate of ED referral rate by 34%.

The number of UC presentations for chest pain between September 14, 2018 and February 13, 2019 was 1,522 with 230 transfers to the ED (15.1%). After introduction of the protocol (on February 14, 2019), UC visits for chest pain and referrals were reassessed: from August 14, 2019 to January 13, 2020 there were 1,486 presentations for chest pain with 149 transfers (10%), representing a 34 reduction in referrals to the ED (Z statistic is 4.2169, p<0.00001, 95% confidence interval that the difference between the two means is between 2.73% and 7.47%.) (See Table 4.)

**Discussion**

Though clinicians still have considerable concern for MACE when discharging patients from the ED with chest pain,<sup>6</sup> the practice of referring patients with a low-risk HEART score for outpatient evaluation has become more widely accepted. Less is known about the risk of patients with a moderate-risk HEART score and the safety of referring them from UC for an expedited outpatient cardiology evaluation.

After introduction of a protocol to evaluate UC patients with chest pain as outpatients over a span of 12 months, only four of 133 Patients had a MACE. One had a positive stress test and received a stent to the LAD, and two were

Table 2. Patient Demographics		
Age (average): 66 years		
	Number	%
Females	77	58%
Males	56	42%
HEART score		
4	78	59%
5	43	32%
6	12	9%
Arteriosclerosis	49	37%
Hypertension	92	69%
Diabetes mellitus	43	32%
Dyslipidemia	102	77%
Obesity	42	32%
Tobacco abuse	19	14%
CVA/TIA	12	9%
CVA, cerebrovascular accident; TIA,transient ischemic accident		

referred for a cardiac catheterization resulting in coronary artery bypass grafts (CABGs). One patient returned and was found to have an nSTEMI, but this patient had an outpatient referral which deviated from the instituted protocol (the patient did not have a stress test scheduled as ordered by a cardiologist within 3 days due to scheduling problems).

Institution of the protocol resulted in a decrease of 34% in patients referred from the UC to the ED, with

subsequent potential implications including reduced cost, decreased resource utilization, less patient inconvenience, and less potential for over-testing and false positive results.

The risk of MACE in patients after a negative evaluation is low, with one of the primary considerations being missed MI. Hess, et al demonstrated a low rate of adverse outcomes in patients with nSTEMI with a rate of sudden cardiac death of 0.79% in the 6 months following diagnosis.<sup>7,8</sup> Even in the ED setting, there is an exceedingly low risk of clinically relevant cardiac events, including STEMI, life-threatening arrhythmia, cardiac arrest, and death.<sup>9</sup>

After a negative evaluation for chest pain, patients are better able to understand their individual risk and to make decisions using a shared decision-making model.<sup>7,8</sup>

Of the 133 patients referred for expedited outpatient evaluation, 19 (14%) cancelled or did not show up for their cardiology appointments and 101 (76%) were seen within a 3-day window. We attempted to contact all 133 patients by phone. Twelve patients (9%) could not be reached by phone, but lack of MACE was confirmed by chart review.

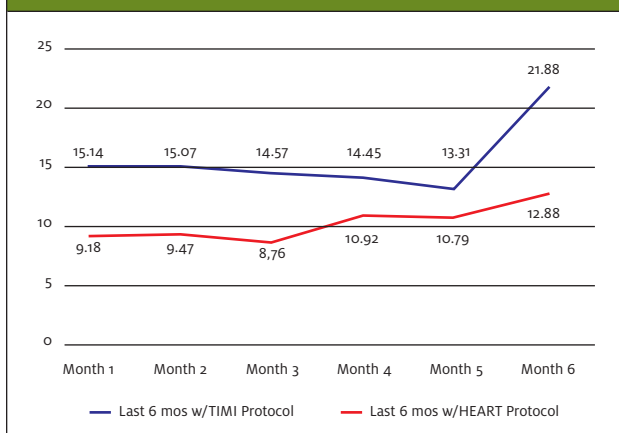
To our knowledge, this is the first study to evaluate MACE outcomes and decreased ED referrals in UC patients after the institution of a protocol for expedited outpatient referral to cardiology. These are the initial results in 133 patients over an 11-month period of time. Future work will focus on validating these results.

**Limitations**

Limitations include missed MACE outcomes with the

Table 3. Patients Referred for Expedited Outpatient Cardiology Follow-Up with MACE within 6 Weeks						
Patient age and sex	Symptoms	HEART score	Positive components	Time to cardiology evaluation	Diagnostic test	MACE outcome
70, M	CP at rest, relieved w/NTG	6	History: 2 Age: 2 Risk: 2	2 days	Multivessel disease on LHC	CABG
68, M	CP w/exertion for 3 mo	6	History: 1 Age: 2 Risk: 2	3 days	Nuclear stress, severe LAD disease on LHC	DES to LAD
67, M	Throat pain w/exercise for 2 wk	6	History: 2 Age: 2 Risk: 2	1 day	Delayed stress test scheduling, Severe RCA disease on LHC	NSTEMI 12 days later, DES to RCA
65, F	Chest pressure at night, DOE	6	History: 1 ECG: 1 Age: 2 Risk: 2	2 days	Multivessel disease on LHC	CABG
CP, chest pain; NTG, nitroglycerin; LHC, left heart catheterization; CABG, coronary artery bypass graft; DES, drug-eluting stent; DOE, dyspnea on exertion; LAD, left anterior descending artery; RCA, right coronary artery; EKG, electrocardiogram						

**Figure 2. ER Transfer Percentages for Chest Pain TIMI vs HEART Protocol**



9% of patients who were not able to be contacted. We did not evaluate for adverse cardiac events after the cardiology visit, such as complications from a cardiac catheterization or a procedure. Past studies have shown that there is some clinician variation in calculation of the HEART score<sup>10,11</sup>; this study did not standardize the calculation and we did not examine for physician variation. Some patients who did not follow up may have had an unrecognized MACE such as a silent MI. Finally, the UCs in this study did have the ability to get troponin testing, and this may limit the generalizability to most UCs where troponin testing is not generally available while the patient is still present.

**Conclusions**

Patients with a moderate-risk HEART score referred from UC for an expedited outpatient cardiology evaluation had a very low rate of MACE outcomes and no deaths. The referral rate to the ED decreased by 34% during the study period. Expedited outpatient cardiology referral for UC patients with chest pain and moderate risk HEART score appears to be a reasonable approach for this patient population. ■

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**Table 4. Referrals from UC to ED: Last 6 months of TIMI vs HEART Protocols**

	Total CP Diagnosis	Transfer to ED	% Transfer to ED
Sep-18	284	43	15.1
Aug-19	316	29	9.2
Oct-18	292	44	15.1
Sep-19	285	27	9.5
Nov-18	254	37	14.6
Oct-19	274	24	8.8
Dec-18	256	37	14.5
Nov-19	238	26	10.9
Jan-19	308	41	13.3
Dec-19	241	26	10.8
Feb-19	128	28	21.9
Jan-20	132	17	12.9

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This study was conducted as a retrospective chart review. Patient identifiers were used only for the purposes of tracking outcomes and measures were taken to ensure no breaches of PHI occurred. The data were initially planned and collected as part of an internal safety and quality monitoring project and care was not changed based on this study. IRB approval was not sought out prospectively for these reasons and the work did conform to usual ethical standards around protecting patient privacy. No funding was obtained for this study.

The authors would like to thank: **Allen Frye, NP** – Research coordinator, Adena Health Systems; **Robert Korkow, MBA** – Senior Data Engineer, Healthcare Economics department, Southwest Medical, part of OptumCare; **John Foreman, PE** – Business Operations Director, Specialties, Southwest Medical, part of OptumCare; **Julia Somerville-Reeser, RN, BSN, RN-BC** – Cardiology Manager, Southwest Medical, part of OptumCare.



# Cannabis-Associated Myocardial Infarction in a Young Woman Without Other Cardiac Risk Factors

**Urgent message:** A growing body of evidence suggests increased cardiovascular risk with frequent cannabis use. With cannabis availability and legalization increasing, the urgent care provider must understand how it affects the risk for acute medical issues among frequent users.

BELLA NAGAPPAN, MD and SUSANNE DEMEESTER, MD

Citation: Nagappan B, Demeester S. Cannabis-associated myocardial infarction in a young woman without other cardiac risk factors. *J Urgent Care Med.* 2020;14(11):36-38.

## Introduction

Cannabis, or marijuana, is legal for recreational use in 11 states and medical use in 33 states.<sup>1</sup> With this increasing availability and legalization, the urgent care clinician must understand its implications on the health of users.

*Cannabis sativa* is a flowering plant native to Central Asia. The female plant produces leaves, buds, and resin containing high amounts of delta-9-tetrahydrocannabinol (THC), the primary active ingredient in cannabis as well as hundreds of other chemicals related to THC (collectively referred to as cannabinoids).<sup>2</sup> Cannabis use has established effects on the central nervous system, gastrointestinal system, and cardiovascular system. It is known to cause tachycardia, hypertension when supine, dysrhythmias, and postural hypotension.<sup>3</sup> A growing body of evidence exists suggesting increased risk of coronary events with frequent cannabis use.<sup>4-7</sup>

## Case Presentation

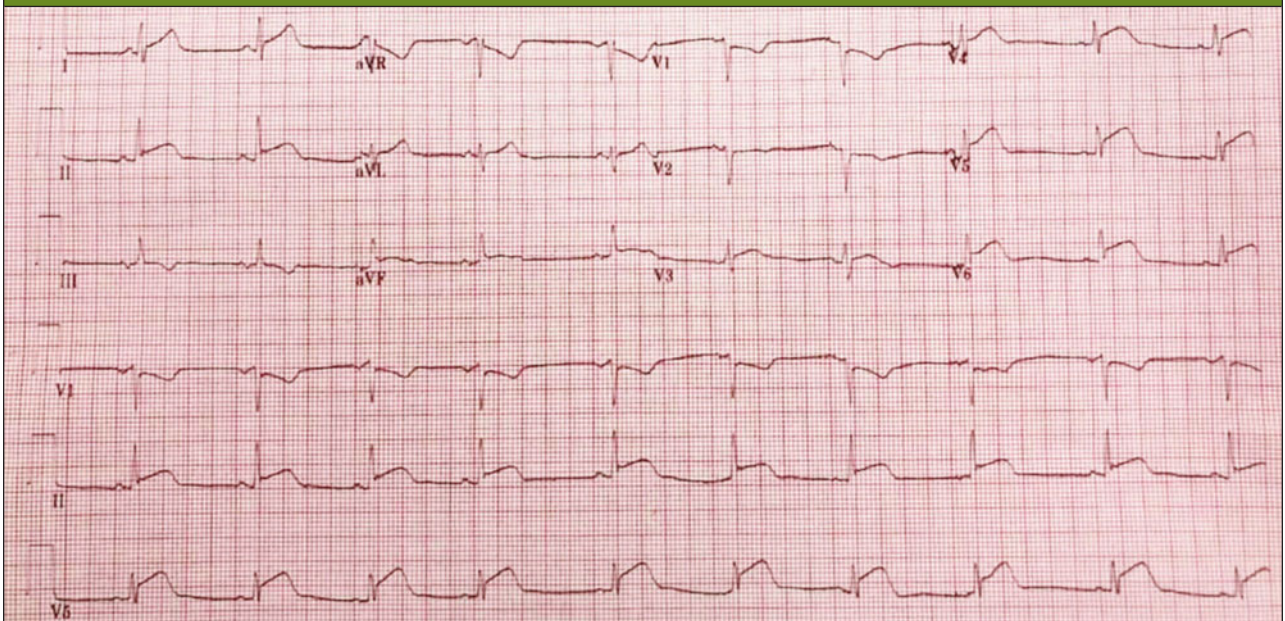
A 32-year-old female presented with a chief complaint of nausea and vomiting. Vomiting began yesterday with gradual onset, nonradiating chest discomfort over the course of 24 hours. She also described anxiety and felt



that she may have been experiencing a panic attack. Her past medical history was notable for anxiety, asthma, and daily marijuana use. The patient had no history of hypertension, hyperlipidemia, or family history of premature coronary artery disease (CAD). Furthermore, she was not obese and did not smoke tobacco. On presentation, her vital signs were 97.4°F, heart rate 75, respiratory rate 16, blood pressure 146/101, and oxygen

Author affiliations: **Bella Nagappan, MD, PGY-4** Emergency Medicine Resident, University of Michigan. **Susanne Demeester, MD**, Director, Emergency Observation Center; Saint Joseph Mercy Hospital. The authors have no relevant financial relationships with any commercial interests.

Figure 1.



saturation 98% on room air.

The differential diagnosis of this patient's presentation includes, but is not limited to, acute coronary syndrome (ACS), pulmonary embolism, aortic dissection, gastroesophageal reflux disease (GERD), pneumothorax, and anxiety/panic attack. She did not have common risk factors (hypertension, hyperlipidemia, family history, tobacco smoker, or age) for ACS or common risk factors for pulmonary embolism (malignancy, prolonged travel, oral contraceptive use, or recent surgeries).

Aortic dissection is less likely in individuals without previous known connective tissue disorders, chronic hypertension, or vascular disease. GERD is a possibility, but worsening pain is unusual and raises concern for another pathology.

Spontaneous pneumothorax is possible and is typically associated with trauma or, in rare cases, menstrual cycles.

Anxiety, while also a possibility, is a diagnosis of exclusion.

Given the large differential diagnosis, the patient underwent a work-up including chest x-ray and electrocardiogram.

The ECG (**Figure 1**) revealed elevation in the inferolateral leads (II, III, aVF, and most prominent in V4-6) consistent with an anterior ST elevation myocardial infarction (STEMI). The chest x-ray showed a normal cardiac silhouette without mediastinal widening, pneumothorax, or pulmonary consolidation. Per facility

protocol, she was given aspirin, ticagrelor, sublingual nitroglycerin, and a heparin bolus. The patient was then transferred to the hospital cardiac catheterization suite.

Her initial laboratory work showed a WBC of 12, hemoglobin 15.3, and platelets 422. Lipid panel after hospital admission revealed total cholesterol 171, HDL 36, LDL 119, triglycerides 79. Urine drug screen was positive for alprazolam, lorazepam, and THC. Her initial troponin was 0.05; after 3 hours it was 5.98.

In the catheterization suite, she was found to have 99% left anterior descending coronary artery (LAD) occlusion with plaque rupture involving the diagonal branch. A drug-eluting stent was placed, and she was admitted to the hospital.

Transthoracic echocardiogram showed an ejection fraction of 49% with apical regional wall abnormality and normal right ventricle chamber size. As this patient had no classic risk factors for CAD, the managing cardiology team concluded that her daily marijuana use was the most likely causative factor for her myocardial infarction.

### Discussion

This case illustrates and adds to a growing body of literature documenting cannabis-related coronary events in young patients without other cardiac risk factors. A number of mechanisms have been proposed to explain the increased risk of ACS associated with cannabis use; however, the exact pathophysiology of

**Table 1. State Cannabis Programs**

Adult and Medical Use Regulated Program	Comprehensive Medical Cannabis Program	CBD/Low THC Program	No Public Cannabis Access Program
Alaska	Arizona	Alabama	Idaho
California	New Hampshire	Georgia	Kansas
Colorado	Arkansas	Indiana	Nebraska
District of Columbia	New Jersey	Iowa	South Dakota
Illinois	Connecticut	Kentucky	
Maine	New Mexico	Mississippi	
Massachusetts	Delaware	North Carolina	
Michigan	New York	South Carolina	
Nevada	Florida	Tennessee	
Oregon	Hawaii	Texas	
Vermont	Ohio	Virginia	
Washington	Louisiana	Wisconsin	
	Maryland	Wyoming	
	Minnesota		
	Rhode Island		
	Missouri		
	Utah		
	West Virginia		

Source: National Conference of State Legislatures. Available at: <https://www.ncsl.org/research/health/state-medical-marijuana-laws.aspx>. Accessed August 16, 2020.

this relationship remains unknown.

The human body has two primary cannabinoid receptors (CB1 and CB2). CB1 receptors are primarily found in the central nervous system, cardiovascular system, and periphery while CB2 receptors are located predominantly in the GI tract and periphery.<sup>8</sup>

One theory suggests that activation of CB1 and CB2 receptors on the platelet cell membrane leads to a concentration-dependent increase in expression of glycoprotein IIb-IIIa and P selectin.<sup>9</sup> These proteins are responsible for the final pathway of platelet aggregation and likely create a prothrombotic state in otherwise healthy cannabis users.

Sugamura, et al found reduction in atherosclerosis in an animal model receiving cannabinoid receptor antagonists.<sup>10</sup> This has potential for extrapolation to suggest increased atherogenesis with CB1 agonism, though further studies are needed. Hypertension when supine and postural hypotension are known cardiovascular effects of cannabis and may precipitate angina in moderate- or higher-risk individuals. Smoking cannabis may also transiently increase carboxyhemoglobin levels, leading to decreased oxygen transport to the heart.

Mittleman, et al found a 4.8-fold increased risk of ACS in marijuana users 60 minutes after use compared with nonusers. This risk rapidly declined in the second hour following use, suggesting only a temporary increase in cardiovascular risk that was less severe than that associated with cocaine.<sup>11</sup>

Further studies are certainly needed to determine the underlying pathophysiologic mechanisms and temporal relationship to marijuana use. Nonetheless, based on

*“This case illustrates and adds to a growing body of literature documenting cannabis-related coronary events in young patients without other cardiac risk factors.”*

current evidence, it is prudent to consider regular marijuana use to be a risk factor for coronary events, especially in patients with a presentation consistent with ACS, and to counsel patients who use marijuana regularly accordingly. ■

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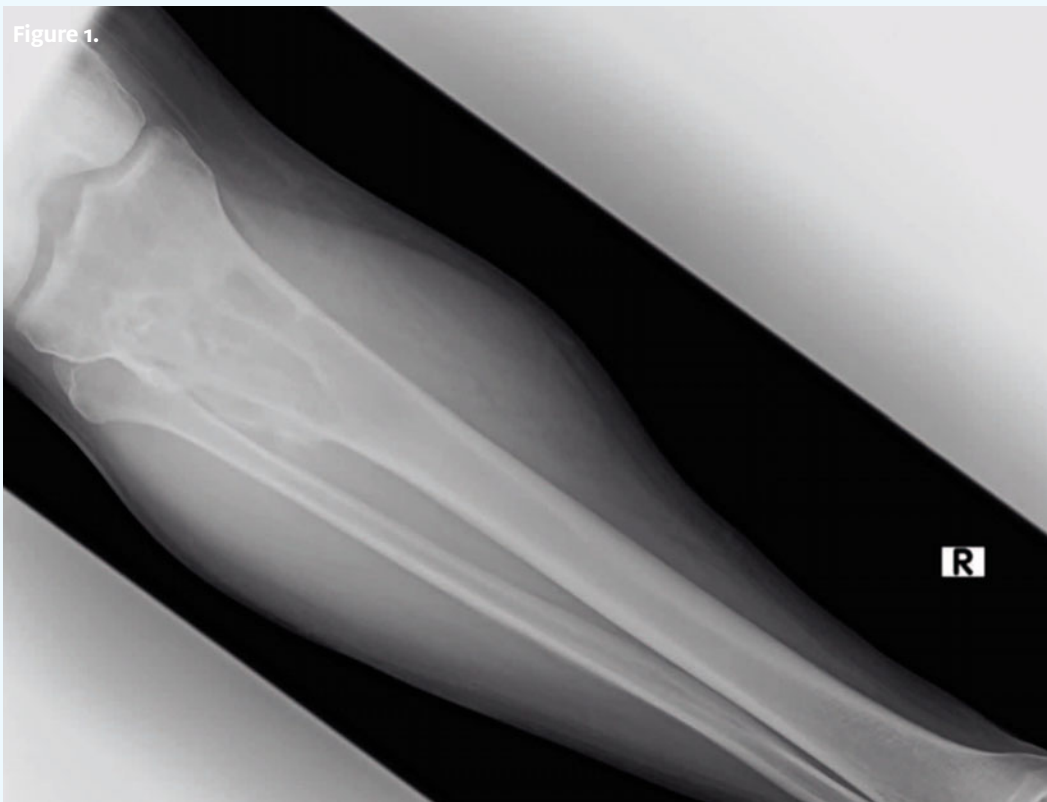




In each issue, *JUCM* will challenge your diagnostic acumen with a glimpse of x-rays, electrocardiograms, and photographs of conditions that real urgent care patients have presented with.

If you would like to submit a case for consideration, please email the relevant materials and presenting information to [editor@juqm.com](mailto:editor@juqm.com).

## A 58-Year-Old Male with a Painful Mass on His Knee

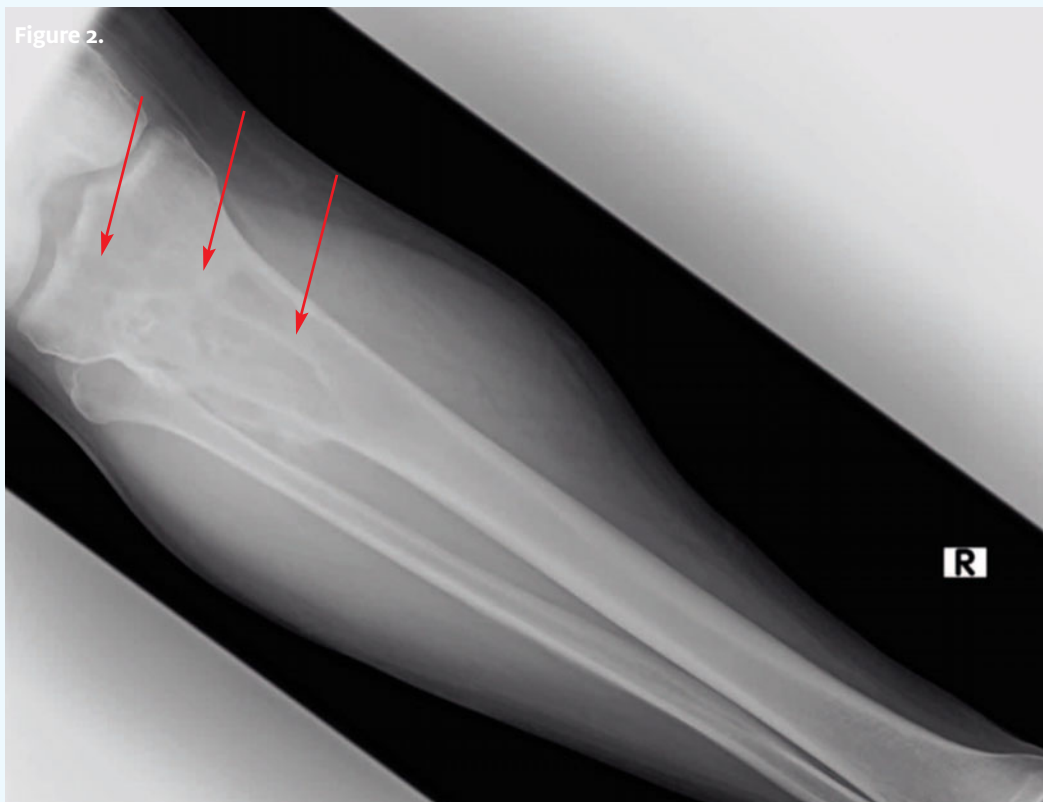


### Case

The patient is a 58-year-old male who presents with a painful mass at the lower aspect of his right knee. He denies any impact to his leg, but reports that the pain started “some time ago,” getting progressively worse.

Review the image taken and consider what the diagnosis and next steps would be. Resolution of the case is described on the next page.

## THE RESOLUTION

**Differential Diagnosis**

- Metastatic disease
- Giant cell tumor
- Malignant transformation of a pre-existing bony dysplasia

**Diagnosis**

Aggressive expansile lesion proximal tibia with pathological fracture and malignant features. Proximal tibial diaphysis was an expansile lesion of 5.0 x 5.3 x 10.3 cm. The lesion has mostly lucent or cystic components with areas of amorphous calcifications within. Lesion is expansile with endosteal scalloping, bowing, and thinning of the overlying cortex. There is a focal anterior cortical break present at the site of the pathological fracture. There is abnormal periosteal new bone formation along the anterior surface in a sunburst pattern and overlying soft tissue swelling.

**Learnings/What to Look for**

- The sunburst appearance of periostitis occurs when the lesion grows too fast and the periosteum does not have enough time to lay down a new layer. Instead, the Sharpey's fibers stretch out perpendicular to the bone
- Sunburst periostitis is classically associated with osteosarcoma, but can also occur with other aggressive bony lesions such as Ewing's sarcoma or osteoblastic metastases (eg, prostate, lung or breast cancer)

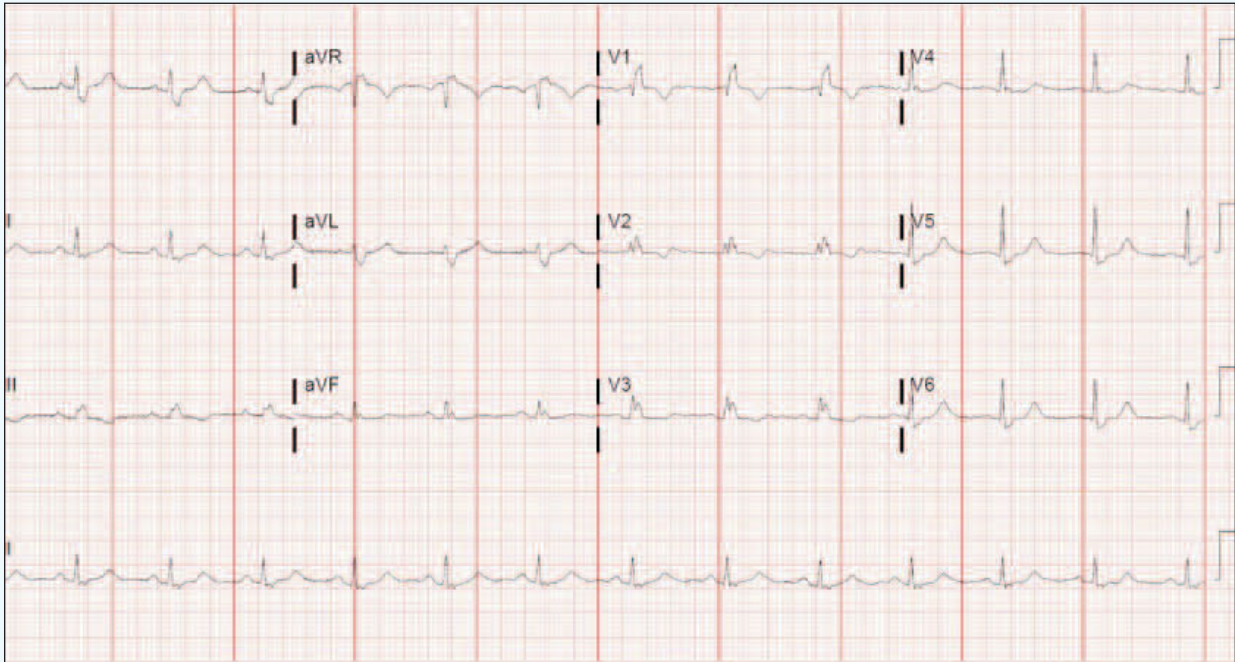
**Pearls for Urgent Care Management and Considerations for Transfer**

- This patient is likely to require surgery, radiotherapy, and/or chemotherapy. Referral to an orthopedic oncologist is appropriate

**Acknowledgment:** Images and case provided by Experity Teleradiology ([www.experityhealth.com/teleradiology](http://www.experityhealth.com/teleradiology)).



## A 42-Year-Old Male with an Abnormal ECG



### Case

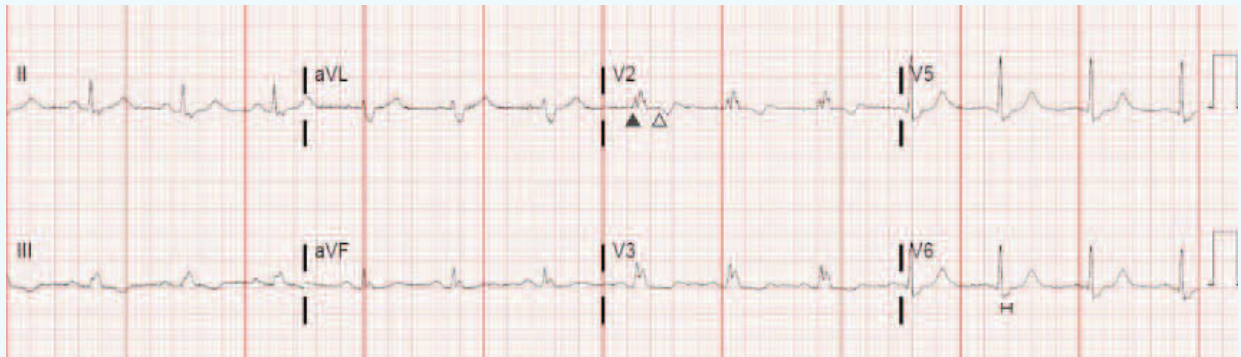
The patient is a 42-year-old male who presents after referral from a diagnostic testing site with an abnormal ECG, obtained during a preoperative evaluation. He reports a history of hypertension and symptomatic inguinal hernia, and acknowledges chronic right groin pain. He is otherwise asymptomatic, including robust exercise tolerance.

View the ECG and consider what the diagnosis and next steps would be. Resolution of the case is described on the next page.

*(Case presented by Tom Fadial, MD, The University of Texas Health Sciences Center of Houston McGovern Medical School.)*



## THE RESOLUTION



**Figure 2.** Anterior precordial lead  $V_2$  shows “M”-shaped RSR’ pattern (▲) (long arrows) and associated repolarization changes (△). Lateral leads I and  $V_6$  show S-wave  $>40$ ms

### Differential Diagnosis

- Pulmonary embolus
- Right ventricular hypertrophy
- Right bundle branch block
- Anterior STEMI
- Myocarditis
- Hyperkalemia

### Diagnosis

This patient was diagnosed with a right bundle branch block (RBBB). The ECG demonstrates normal sinus rhythm at a rate of 78bpm. The QRS duration is prolonged, measuring  $>120$ ms. The QRS appearance is “M”-shaped in the anterior precordial leads ( $V_1$ - $V_3$ ) and there is a slow, slurred S-wave with a duration exceeding 40ms in the lateral leads (I, aVL,  $V_6$ ).

These changes are caused by a right bundle branch block (RBBB). In an RBBB, the conduction of the left bundle branch is unaffected, resulting in a normal appearance of the early part of the QRS complex. Delayed right-ventricular activation results in a second R-wave (R’) in the anterior precordial leads (producing the RSR’ or “M”-shaped appearance) and also causes the slurred appearance of the S-wave in lateral leads.

As occurs with other *depolarization* disturbances, *repolarization* changes are common including ST-segment deviations (typically minimal and discordant with the QRS vector) and T-wave changes (similarly discordant) resulting in the T-wave inversions seen in anterior precordial leads.

RBBB can occur in normal hearts and is a benign finding in an otherwise healthy patient. However, the differential diagnosis includes ominous considerations such as processes resulting in acute or chronic elevations in right ventricular pressure (pulmonary embolus, pulmonary hypertension). Other causes include myocardial ischemia or inflammation (such as myocarditis), as well as intrinsic conduction system disease.

As a result, the clinical relevance of RBBB is variable. While

the presence of an RBBB may be associated with increased rates of heart failure, pacemaker requirement, and even all-cause mortality over longer periods of time, in the urgent care setting the focus remains on the identification of an acute or progressive precipitant.<sup>1,2</sup> For asymptomatic and otherwise-healthy patients, a careful history and physical examination to evaluate for causes of right ventricular strain (pulmonary embolus, pulmonary hypertension, or other cardiomyopathies) or features suggestive of cardiac ischemia is sufficient.

### Learnings/What to Look for:<sup>3</sup>

- QRS duration  $>120$ ms
- RSR’ in  $V_1$  or  $V_2$
- S-wave of greater duration than R-wave or 40ms in leads I,  $V_6$
- An “incomplete” RBBB matches the same diagnostic criteria with a QRS duration between 110-120ms

### Pearls for Urgent Care Management and Considerations for Transfer

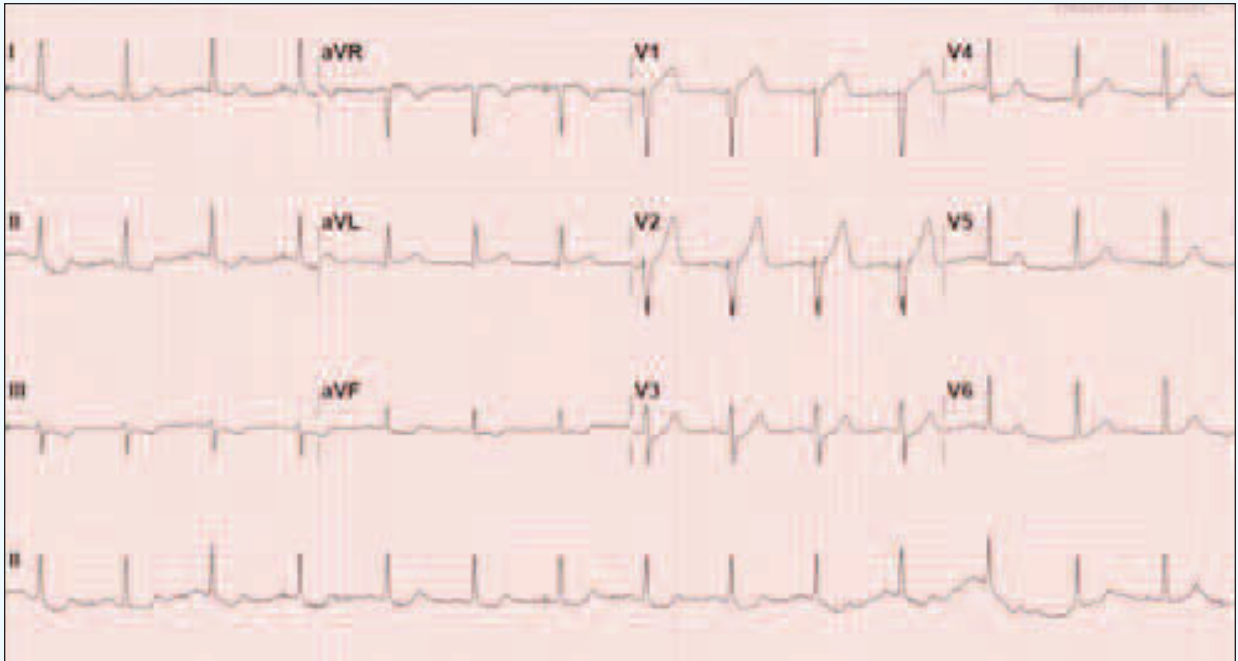
- Evaluate for acute or progressive precipitant of right ventricular strain such as pulmonary embolus, pulmonary hypertension, cardiomyopathy or ischemia
- The presence of a RBBB does not interfere with the usual diagnosis of a myocardial infarction

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## Chest Pain in a 44-Year-Old Male: Is It Too Early for Emergent Coronary Intervention?



### Case

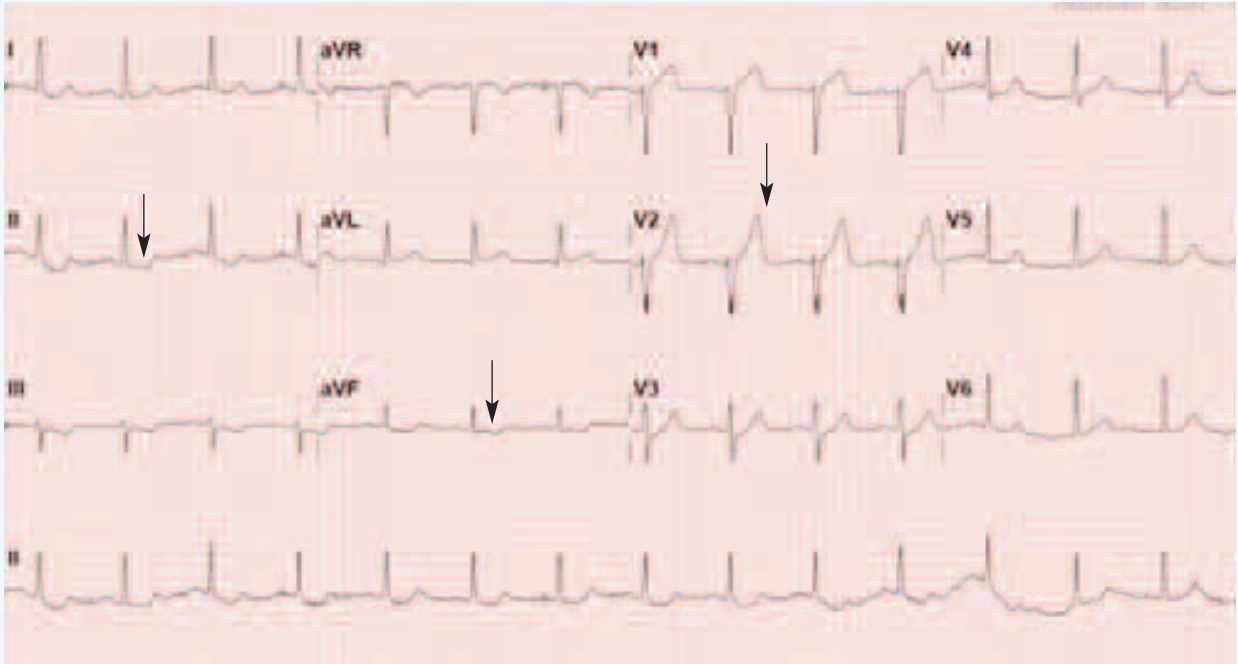
The patient is a 44-year-old previously healthy male who presents with continuous, typical cardiac chest pain of a few hours' duration, with no associated symptoms. He reports that this is a first-time occurrence. He also relays that he is a nonsmoker, nonalcoholic with no family history of heart disease.

On physical examination, you find his vital signs are stable. Cardiac auscultation reveals normal first and second heart sounds with no murmurs. Labs reveal slightly elevated cardiac enzymes. Other routine laboratory results are within normal ranges.

View the ECG and consider what the diagnosis and next steps would be. Resolution of the case is described on the next page.

*(Case presented by Omar Al-assaf, Internal Medicine Department, Rashid Hospital, Dubai Health Authority; Muna AlJallaf, Cardiology Department, Rashid Hospital, Dubai Health Authority; and Anas Musa Emergency Department, Rashid Hospital, Dubai Health Authority.)*

## THE RESOLUTION

**Differential Diagnosis**

- Wellens' syndrome
- De Winter syndrome
- Brugada
- Shark fin

The ECG shows sinus rhythm with small P wave, deep S wave, hyperacute T wave, mild ST elevation in anterior leads, and ST depression in inferior leads indicating de Winter syndrome. The patient was taken for urgent coronary angiography which showed acute occlusion of the proximal left anterior descending coronary artery (LAD) and successful recanalization was done by implanting a single drug-eluting stent.

De Winter syndrome, an electrocardiographic pattern, was first described in 2008 by de Winter, et al as an indicator of acute left anterior descending artery occlusion. It is characterized by upsloping ST segment depression by more than or equal to 0.1 mV at the V1–V6 leads with symmetrical tall T waves.<sup>1</sup> In 2017, Morris, et al published a systematic review and found that de Winter pattern holds a positive predictive value of 95.2% to 100% for acute proximal LAD occlusion.<sup>2</sup>

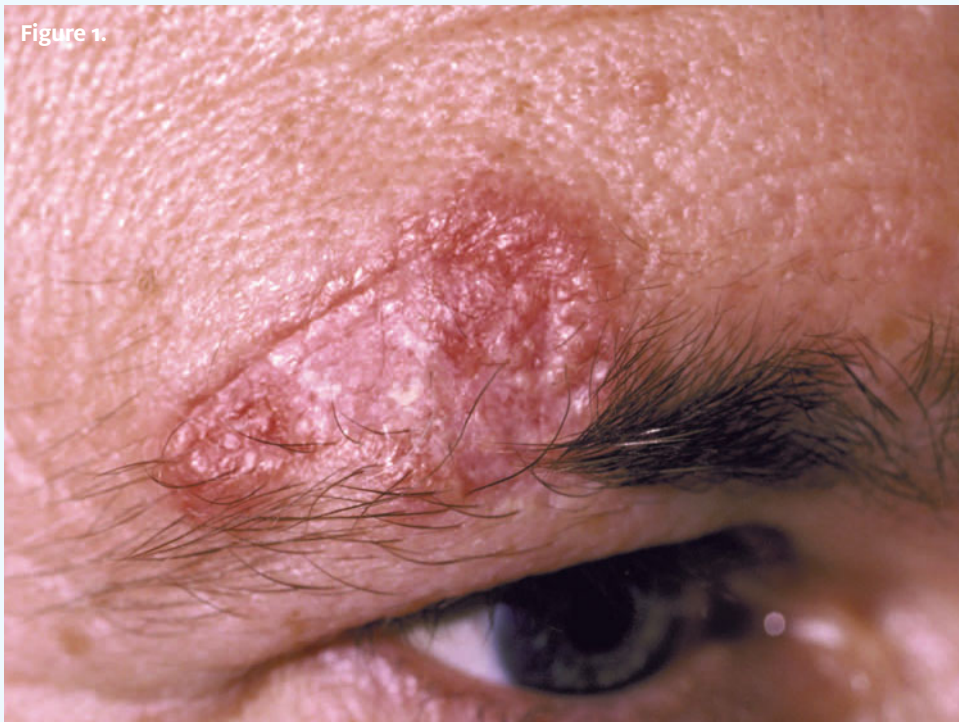
ECG abnormalities other than ST-segment elevation are known to indicate transmural myocardial injury; hence, immediate reperfusion is highly recommended to avoid extension of the myocardial injury. STEMI management for primary coronary intervention in STEMI management guideline must be followed since the myocardial damage in de Winter pattern can be reversible.<sup>3</sup>

**References**

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## A 37-Year-Old Male with an ‘Itchy’ Lesion on his Face



### Case

The patient is a 37-year-old male who presents with a red, round lesion with a fine, scaly plaque on his face which developed over the past month. He also reports seeing similar lesions on his scalp while combing his hair. None of the lesions are painful, though he describes them as “slightly itchy.” No history of injury to the area.

Review the image above and consider what your diagnosis and next steps would be. Resolution of the case is described on the next page.



## THE RESOLUTION

**Differential Diagnosis**

- Tinea corporis
- Lichen planus
- Discoid lupus erythematosus
- Sarcoidosis
- Basal cell carcinoma

**Diagnosis**

This patient was diagnosed with discoid lupus erythematosus (DLE), a disfiguring autoimmune skin disease and the most common form of chronic cutaneous lupus erythematosus.

**Learnings/What to Look for**

- DLE has a characteristic clinical appearance consisting of red, scaly plaques with resulting pigmentary changes and scars; the plaques are frequently found on the face and scalp
- Discoid rash is one of the 11 diagnostic criteria for systemic lupus erythematosus (SLE); 20% of patients with SLE will manifest discoid lesions. However, only 5% to 10% of patients

with DLE demonstrate systemic involvement or will go on to develop SLE

- DLE most commonly afflicts women in the third and fourth decades of life, although it may occur at any age and in either gender
- Individuals of African and Hispanic descent are at increased risk, and there may be a positive family history of lupus or connective tissue disease

**Pearls for Urgent Care Management and Considerations for Transfer**

- Patients with DLE should be counseled to employ sun-protection measures such as sunscreen, photoprotective clothing, brimmed hats, and avoiding exposure to the sun during peak hours
- Topical retinoids have been reported to be helpful
- Rarely, squamous cell carcinoma may rarely develop in chronic DLE scars, especially in sun-exposed areas

**Acknowledgment:** Images and case courtesy of VisualDx ([www.VisualDx.com/JJUCM](http://www.VisualDx.com/JJUCM)).



# What's New for ICD-10 in 2021?

■ MONTE SANDLER

It's that time of year again. On October 1, 2020, the annual update to ICD-10 codes goes into effect. Just a reminder—there is no grace period. Use of deleted or invalid diagnosis codes will result in claim denial and delay payment.

The *ICD-10-CM Official Guidelines for Coding and Reporting FY 2021 (October 1, 2020 – September 30, 2021)* have also been updated. These are provided by the Centers for Medicare and Medicaid Services with the National Center for Health Statistics.

### COVID-19

The coding guidelines regarding COVID-19 have been added to the official guidance and take the place of the interim rules that were released earlier this year. How you code COVID-19 is a factor in whether these claims process correctly and to avoid balances the patient should not be required to pay.

Only confirmed cases as documented by the provider or confirmed by test results should be coded with ICD **U07.1**, *COVID-19*. This code should be the primary diagnosis on the claim. Codes for any acute respiratory manifestations due to COVID-19 should be additional diagnoses (eg, pneumonia). This is also the case for non-respiratory manifestations caused by COVID-19.

Suspected cases of COVID-19 should be coded with signs and symptoms (eg, fever or cough).

Asymptomatic patients with actual or suspected exposure should be coded with ICD **Z20.828**, *Contact with and (suspected) exposure to other viral communicable diseases*. This is a change from prior guidance which said to code ICD **Z03.818**, *Encounter for observation for suspected exposure to other biological agents ruled out*, for possible exposure. ICD **Z03.818** no longer appears in the official guidelines.

Another ICD code in the interim guidelines that has been removed is ICD **Z11.59**, *Encounter for screening for other viral diseases*. Per the official guidelines, during the COVID-19 pandemic a screening code is “generally not appropriate.” Even COVID-19 testing for preoperative purposes should be coded

as exposure, ICD **Z20.828**.

Diagnoses added to this guidance are:

- History of COVID-19: **Z86.19**, *Personal history of other infectious and parasitic diseases*
- Follow-up visits after COVID-19 has resolved: **Z09**, *Encounter for follow-up examination after completed treatment for conditions other than malignant neoplasm*, and **Z86.19**
- Encounter for antibody testing: **Z01.84**, *Encounter for antibody response examination*
- No new ICD codes were created for reporting COVID-19

### Vaping-Related Disorders

ICD **U07.0**, *Vaping-related disorder*, was issued in the middle of 2020. For conditions related to vaping, this should be the primary diagnosis on the claim. For lung injury due to vaping, only code **U07.0** is assigned. If the patient presents with other manifestations due to vaping (eg, acute respiratory failure), this should be an additional diagnosis.

Respiratory signs and symptoms due to vaping would not be coded separately when the cause is established. Gastrointestinal symptoms would be coded separately.

*“Unspecified is used if the documentation does not provide further information for assigning a more specific ICD code. Other is used when the ICD code set does not go to the detail required for a more specific code.”*

### Other Changes

A new code set was added for withdrawal from alcohol use (F10.930-F10.939) or abuse (F10.130-F10.139). The sixth digit identifies related symptoms (eg, delirium).

Similar codes were added for mental and behavioral disorders due to withdrawal from other psychoactive substance use:

- Opioid abuse (F11.13)
- Cannabis (F12.13)
- Sedative, hypnotic, or anxiolytic (F13.130-F13.139)
- Cocaine (F14.13 or F14.93)
- Stimulants (F15.13)



**Monte Sandler** is Executive Vice President, Revenue Cycle Management of Experity (formerly DocuTAP and Practice Velocity).

*“Numerous notes have been added throughout ICD-10 to direct users to the correct code. Even if you have used a code before, this is the time to doublecheck, to ensure you’re using it correctly and will get reimbursed accordingly.”*

■ Other substances (F19.130-F19.139)

Fifth digits have been added to ICD codes for esophagitis and gastro-esophageal reflux disease (GERD) to indicate whether bleeding is involved:

- K20.80: Other esophagitis without bleeding
- K20.81: Other esophagitis with bleeding
- K20.90: Esophagitis, unspecified without bleeding
- K20.91: Esophagitis, unspecified with bleeding
- K21.00: GERD with esophagitis, without bleeding
- K21.01: GERD with esophagitis, with bleeding

*Unspecified* is used if the documentation does not provide further information for assigning a more specific ICD code. *Other* is used when the ICD code set does not go to the detail

required for a more specific code.


Stage 3 (moderate) chronic kidney disease now requires a fifth digit to indicate if it is stage 3a (N18.31), stage 3b (N18.32), or unspecified (N18.30).

Headache (R51) needs a fourth digit for an orthostatic component, not elsewhere classified (R51.0). Use R51.9 for Headache, unspecified. The term *not elsewhere classified* (NED) indicates there may be diagnoses elsewhere that better describe the condition. Coders should follow the new Excludes2 notes for guidance.

Additional digits have been added to the superficial injury of the thorax section of the injury chapter to specify the location further (S20.213-S20.374).

Codes T40.4X1-T40.4X6 for poisoning by, adverse effect of, and underdosing of other synthetic narcotics were deleted. Codes that specify the substance (eg, fentanyl) have been added (T40.411-T40.496).

Numerous notes have been added throughout ICD-10 to direct users to the correct code. Even if you have used a code before, this is the time to doublecheck, so you continue to use it correctly and get reimbursed accordingly.■



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# Left on the Bench at the Start of the Pandemic, Urgent Care Rebounds in a Big Way

If you worked in an urgent care center located anywhere but a major urban hotspot at the outset of the COVID-19 pandemic, it's likely your business suffered. You may have even seen your team diminished or your business (we hope temporarily) closed.

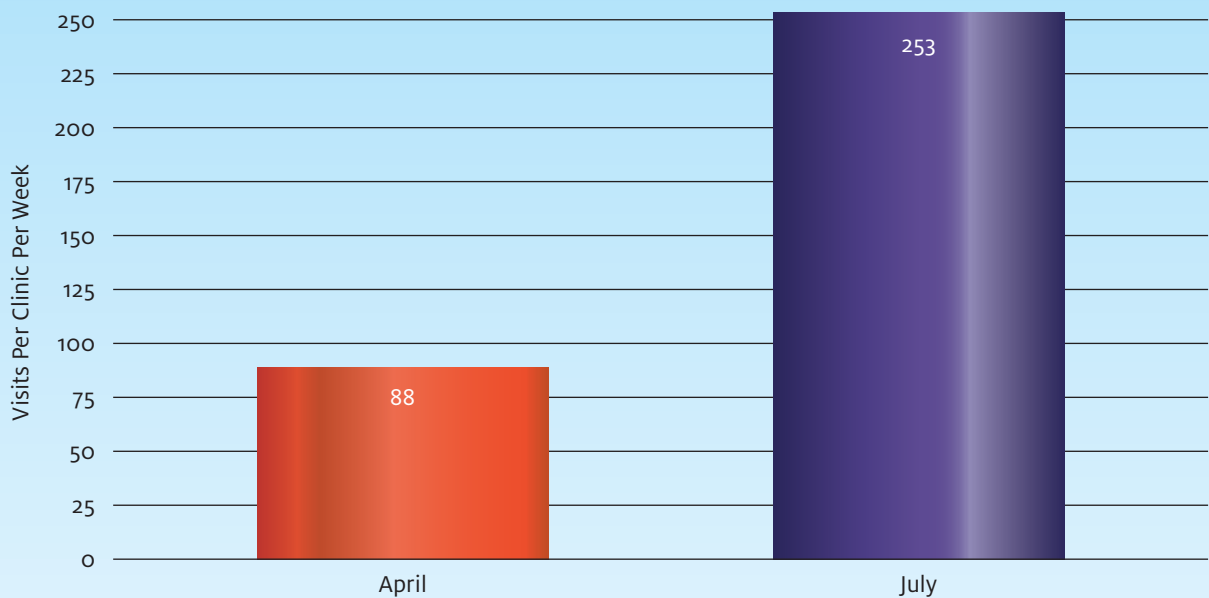
It didn't have to be that way.

Between testing patients for COVID-19 and treating others for whom there was no room at the emergency room, it should have been a shining moment for our industry. Instead, essential testing supplies went elsewhere—a situation that has since been rectified—and patients who needed nonemergent care were too unnecessarily afraid of infection to visit their local urgent care center.

Thanks to perseverance, public education, and an ever-evolving sense of how to respond, however, urgent care is surging again. According to data from Experity, based on their client base of more than 5,700 clinics, average visits per center per week grew more than two-and-a-half fold from their nadir in April to their zenith in July. (See the graph below.)

With predictions that the U.S. case load will start creeping up in the fall, urgent care appears to be on surer footing to both weather the crisis and help the healthcare system manage, saving lives (and businesses) in the process.

### FROM THE DEEPEST VALLEY TO THE HIGHEST PEAK: SLOWEST AND BUSIEST MONTHS' VISITS DURING THE PANDEMIC



Data source: Experity ([www.experityhealth.com](http://www.experityhealth.com)).





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