

# Bouncebacks

## A 34-Year-Old Man with Left Side Pain

In *Bouncebacks*, which appears periodically in *JUCM*, we provide the documentation of an actual patient encounter, discuss patient safety and risk-management principles, and then reveal the patient's bounceback diagnosis.

This month's case reflects the actual documentation from an urgent care visit, and the patient's bounceback the next day to the emergency department. Can you spot the red flags without knowing the outcome?

MICHAEL B. WEINSTOCK, MD, and MIZUHO SPANGLER, DO

### Introduction

A picture tells a thousand stories, but from the story that follows, it is hard to conjure a picture. We are sure it was pretty straightforward at the bedside; the patient has "left side pain." But an outside observer looking back at the chart wonders, "Hmmm . . . left side of *what?*"

### Deep Thoughts

1. Do certain complaints require a more extensive urgent care history and examination?
2. What is the heuristic "premature closure"?
3. What red flag often warns of a possible misdiagnosis?

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**Michael B. Weinstock, MD**, is Associate Clinical Editor for *JUCM*; Adjunct Professor of Emergency Medicine, Ohio State University; Chairman and Director of Medical Education, Mount Carmel St. Ann's Hospital Department of Emergency Medicine, Columbus, Ohio; Editor-in-Chief, *Urgent Care: Reviews and Perspectives (UC:RAP)*; and Risk Management Section Editor for *Emergency Medicine Reviews and Perspectives (EM:RAP)*. Dr. Weinstock welcomes coauthor **Mizuho Spangler, DO**, Assistant Professor of Clinical Emergency Medicine at LAC+USC <None>Medical Center Department of Emergency Medicine, Los Angeles, California, and Executive Editor, *UC:RAP*.



4. What is the role for a "medical decision-making" note in the urgent care chart?

**Note:** The record that follows is the *exact* documentation recorded by the urgent care provider, except that

Vital Signs						
Time	Temperature	Pulse	Respiratory Rate	Systolic Blood Pressure	Diastolic Blood Pressure	Oxygen Saturation (Room Air)
19:32	98.4°F	96 beats/min	13 breaths/min	134 mm Hg	79 mm Hg	96%

the dates of the visit and the names of health-care providers and family members have been changed.

### Urgent Care Visit

**Chief complaint:** Left side pain

**Date:** April 19

#### History of Present Illness

Presents with chief complaint of left side pain which started last night and has got worse as the day has progressed. Constant pain. Pain is deep. Denies injury. Worse with deep breath. No fever, cough, abd. [abdominal] pain, flank pain, change in urination, n/v [nausea/vomiting], rash, weakness, increased tiredness.

#### Past Medical History

**Allergies:** Penicillin

**Meds:** None

**PMH/PSH [past medical history/past surgical history]:** Negative

**SH [social history]:** No smoking, occ. [occasional] alcohol

#### Physical Examination

**Constitutional:** Well developed, well nourished. No distress.

**Lungs:** Decreased breath sounds LLL [left lower lobe], no rhonchi

**Chest:** There is no tenderness of the chest wall

**Card [cardiology]:** Regular rate and rhythm, nl [normal]. S1 S2, no murmur

### Emergency Department Course

**CXR [chest x-ray]:** (interpretation per urgent care physician): Small infiltrate LLL

**Diagnosis:** Pneumonia

**Disposition:** Azithromycin. Albuterol inhaler. Follow up with ER [emergency room] if pain worsens overnight. Primary care in 2–3 days if not better.

### The Errors: Risk-Management and Patient-Safety Issues

*(Authors' note: This is a pretty slim chart. Often that is not a problem, as in, for example, "inversion injury while playing*

*basketball yesterday." We get the picture. But the chart in this case is not for an ankle strain; it is chest pain (or abdominal pain—we aren't sure). The most important part of the record is that an objective reader can hear the story, a story that flows from beginning to end and provides a plausible explanation for the diagnosis. This is a recurrent theme in failure-to-diagnose urgent care cases. Playing the odds only gets you so far. Is anyone satisfied with being right 99% of the time? Of the 150,000 to 200,000 patients we will each see during the course of our careers, 99% equals . . . what? About 1500 to 2000 misdiagnoses.)*

#### Error #1: Inadequate history.

**Discussion:** Every patient needs a history, some more than others. This patient had side pain—the *side* of his chest. In other words, we have a 34-year-old-man with chest pain. Now the required elements of the history become more important:

- Is the pain exertional? Consider acute coronary syndrome (ACS) or myocardial infarction (MI).
- Are there associated symptoms of dyspnea or diaphoresis? Consider ACS, pulmonary embolism (PE), and pneumonia.
- Is there radiation to the back? Consider aortic dissection.
- Are there infectious symptoms of cough or fever? Consider pneumonia.
- Is there a rash? Consider herpes zoster.

**Teaching point:** It is hard to make a correct diagnosis without adequate data.

#### Error #2: Inadequate physical examination

**Discussion:** A 34-year-old man with chest pain leaves a lot open in our differential. Of the 6 life-threatening causes of chest pain listed below, the last 3 can fairly reliably be excluded with simply a good physical examination. A lack of asymmetric breath sounds, tachycardia, tachypnea, jugular venous distention (JVD), and tracheal deviation makes both tension pneumothorax and pericardial tamponade extremely unlikely. Historically speaking, pain that did not start in relation to vomiting essentially excludes Boerhaave syndrome.

These are the 6 life-threatening causes of chest pain:

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## BOUNCEBACKS

*“The most important part of the record is that an objective reader can hear the story, a story that flows from beginning to end and provides a plausible explanation for the diagnosis. This is a recurrent theme in failure-to-diagnose urgent care cases.”*

- ACS
- PE
- Aortic dissection
- Tension pneumothorax
- Pericardial tamponade
- Boerhaave syndrome

Additional elements of the physical examination that might have been helpful include the following:

1. Unilateral swelling of the extremities (deep vein thrombosis [DVT] or PE)
2. Peripheral pulses (aortic dissection)
3. Neck examination (JVD with pericardial tamponade, tracheal deviation in tension pneumothorax)
4. Visual inspection of chest wall (herpes zoster rash makes a diagnosis; abrasion or contusion makes the diagnosis for musculoskeletal pain)
5. Back examination (costovertebral angle tenderness may be from pyelonephritis or ureterolithiasis)

**Teaching point:** A thorough medical history will make the diagnosis 73% to 92% of the time,<sup>1,2</sup> but *sometimes* examination findings are helpful.

### Error #3: Premature closure.

**Discussion:** In the 2002, Pat Croskerry, a Canadian emergency physician, described “premature closure” as the acceptance of a diagnosis before it has been fully verified.<sup>3</sup> This may occur because of another bias commonly practiced: anchoring bias—in other words, “anchoring” onto vivid presenting features, often early in the course of the evaluation. In this case the physician was without a diagnosis; no respiratory symptoms, no history of injury, no pain with palpation, no rash. When the chest x-ray showed what was thought to be an infiltrate, the diagnosis of pneumonia was anchored onto, and the evaluation was prematurely closed without further exploration of the cause. When an infiltrate is seen on the chest x-ray, further history should be obtained as support for this diagnosis: cough, shortness of breath, fever, rhinorrhea, exposure to others who have been ill. When the patient bounced back, the diagnosis was made at the bedside on the basis of a more thorough history. It was then confirmed with further testing.

**Teaching point:** A finding not consistent with the medical history does not make a diagnosis.

#### Error #4: Diagnostic uncertainty.

**Discussion:** Remember deep thought #3 earlier? This patient had a huge red flag waving, one that would be seen by most physicians as well as the physician's neighbor: How do you have pneumonia in a healthy young man who has no cough or fever? If you were this patient and someone prescribed a Zithromax Z-pak for you, would you even bother to fill the prescription? Here is some foreshadowing—the patient did not.

**Teaching point:** When the diagnosis does not match the findings on the medical history and physical examination, both need further exploration.

#### Error #5: Not getting an electrocardiogram (ECG).

**Discussion:** Should an ECG have been obtained? If further history confirmed exertional symptoms, associated diaphoresis and dyspnea, or serious risk factors, it could have been considered. Though normal ECG findings do not exclude ACS or MI, positive findings will enable rapid and accurate diagnosis, facilitating prompt care.

**Teaching point:** An ECG is a simple, inexpensive test that can help exclude heart disease.

#### Error #6: Failure to consider a more serious diagnosis.

**Discussion:** We mentioned the differential for chest pain earlier, but we still have not excluded what would be our first thought. Though there are some criticisms of the medical history obtained, the truth is that the sentinel aspect of the history actually *was* obtained. The pain was “worse with deep breath.” Ever heard of a “zebra retreat”? The term refers to considering an unusual diagnosis and then excluding it because it is rare.<sup>3</sup> Did this provider consider PE? And why would a 34-year-old man have a PE anyway? Is there some supporting history obtained on the bounceback visit that could have clinched the deal for the urgent care provider had it been obtained? Read on.

**Teaching point:** Our urgent care mantra is “Think worse first.”

### The Bounceback

The next day, the patient presented to the emergency department at 5:27 a.m. (10 hours after presentation to the urgent care center). The chief complaint was difficulty breathing. He had not filled his prescription.

- **HPI [history of present illness]:** “Two days of left sided chest pain which is constant and dull and intermittently sharp when he takes a breath. No rhinorrhea or coughing. No fevers. No radiation. No exertional component. He did strain his left calf while playing basketball one and a half weeks ago. No prolonged immobilization casts or splint to the lower extremities or lower extremity swelling. No history of cancer, hemoptysis, recent surgery, blood clotting problems or hormone therapy.
- **PE:** Normal, no calf muscle pain
- **Testing:**
  - ECG: Normal sinus rhythm (NSR) and otherwise normal
  - Venous Doppler: Acute DVT left LE [lower extremity]
  - CTA [computed tomography angiography]: Acute PE right lower lobe, atelectasis
- **Diagnosis:** Acute pulmonary embolus, left LE DVT
- **Treatment:** Lovenox and Coumadin, hospital admission

**Note:** Repeat vitals just prior to patient going to floor show pulse 80 and O<sub>2</sub> sat 96%

### Discussion

Well, this was a tough diagnosis . . . or was it? We can look at the initial presentation from two perspectives:

1. A young, healthy patient with normal pulse and respiratory rate has “side pain” and an infiltrate in this exact location. The patient is prescribed an antibiotic recommended by the current guidelines of the American Thoracic Society—open-and-shut case. *Or . . .*
2. A young patient healthy enough to strain his calf playing basketball presents with pleuritic chest pain and no respiratory symptoms. How does that pneumonia diagnosis seem now?

The first step in excluding serious life-threatening diseases is to consider them. Though ACS can present with back

Vital Signs						
Time	Temperature	Pulse	Respiratory Rate	Systolic Blood Pressure	Diastolic Blood Pressure	Oxygen Saturation (Room Air)
05:27	Afebrile	99 beats/min	20 breaths/min	113 mm Hg	79 mm Hg	95%

pain, arm pain, epigastric pain, or, in select populations of the elderly and patients with diabetes, simply as diaphoresis, nausea, or dizziness, this diagnosis must at least be considered in all patients who present with chest pain. As previously described, the differential can be divided into 6 life-threatening causes of chest pain:

- The big 3:
  - ACS or acute MI
  - PE
  - Aortic dissection
- The next 3:
  - Tension pneumothorax
  - Pericarditis or pericardial tamponade
  - Esophageal rupture (Boerhaave syndrome)

Whereas the second 3 can be reliably excluded with a careful medical history and physical examination, the first 3 must be further explored on the basis of pretest probability or risk stratification. But risks of ACS, PE, or dissection may be different than those we typically consider. The Framingham risk factors (age, sex, hypertension, diabetes mellitus, etc.) were developed as a tool to stratify patients by risk of an adverse event later in life, not as a gauge of whether patients with acute symptoms will have a serious diagnosis. The American Heart Association specifically states in their newest set of recommendations<sup>4</sup> that the patient's presenting symptoms trump a lack of Framingham risk factors. In other words, a patient with no risk factors who has exertional chest pain, dyspnea, and diaphoresis must undergo a workup to exclude ACS.

Risk factors may help in other ways; encountering patients at risk of atypical presentations of ACS, such as those with diabetes mellitus, the elderly, women, cocaine users, and patients with acquired immunodeficiency syndrome, may induce us to obtain a more thorough medical history. Another prompt discussed previously should be a major risk factor not only with evaluation of chest pain but with all symptoms: lack of an alternative diagnosis. Jeffrey Klein, professor of emergency medicine at Indiana University School of Medicine and fellow of the North Carolina College of Emergency Physicians and one of the world's authorities on PE, makes things very simple: When do you look for PE? When patients have unexplained breathlessness.

In patients for whom there is a low clinical suspicion for PE (i.e., low clinical gestalt—there is <15% chance that the patient will have a PE), studies have shown that the PE

*“When the diagnosis does not match the findings on the medical history and physical examination, both need further exploration.”*

rule-out criteria (PERC) can be a useful tool in decision-making.<sup>5</sup> The nice part is that you can apply it at the bedside and, if findings are negative, obviate need for any further testing. Correct application of

the PERC reduces the probability of PE to <2% in patients at low risk of PE. Here are the criteria:

1. Age <50 years
2. Pulse <100 beats/min
3. Oxygen saturation >95%
4. No unilateral leg swelling
5. No hemoptysis
6. No recent trauma or surgery
7. No prior PE or DVT
8. No hormone use

Thus in patients for whom you have low clinical suspicion and who meet all 8 criteria, the likelihood of PE is low enough that no further testing or imaging is indicated. **Note:** Findings for the PERC can only be negative. In other words, if findings for just one of the criteria are positive, that does *not* mean that further testing (D-dimer or CTA) is required.

## Conclusion

What can we learn from this case?

- The history is key: Only by evaluating for leg or Achilles tendon injury was the index of suspicion for PE increased to the point that a test was ordered.
- All that wheezes is not asthma, and all that coughs is not pneumonia.
- Use of the PERC at the urgent care bedside can decrease the possibility of PE to a low enough level that no further testing is required.
- When considering the possibility of PE, think “unexplained breathlessness.” ■

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