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# What Happens If We Do Nothing?



In its most modern form, medicine revolves around action. We are trained as clinicians to assess, diagnose, and intervene, but it's the intervention part that patients expect most. This is especially true in urgent care (UC), where patients usually present in anticipation of some swift action for whatever is bothering them.

I recently saw a healthy, middle-aged man in our clinic who was complaining of some mild chest pain. He wore a white, pristinely starched shirt and tie with suspenders and cufflinks. I could tell he'd come from one of the nearby office buildings. I began reviewing his chart as he recounted the details of his pain.

The first thing that leaped out from his medical record was a note from the emergency department (ED) from two days prior.

"I see you were seen for chest pain in the emergency department a few days ago," I said.

He nodded.

"And what did they do for you there?" I asked.

"Nothing. They just did some tests and sent me home."

I looked through his ED note more. He had had several EKGs, two sets of troponins, and a CT angiogram of his chest, which were all normal. The ED physician caring for him called a cardiologist and arranged an outpatient follow-up visit for him in a few weeks. It was a thorough work-up to be sure.

"I see. Well, it looks like they evaluated you for the dangerous causes of chest pain, and everything looked okay. You have a cardiologist appointment next week as well. Has something changed?"

"No," he said, pulling his shoulders back, "but the pain's still there, and I need someone to do something about it!"

We repeated an EKG, which was normal again. I probed his history a bit further to be sure I wasn't missing something. He gave short, staccato replies but never looked me in the eye again. Clearly, in his mind, I was just as reckless and callous as the ED doctor who hadn't intervened either. The tension in this encounter arose because the other physician and I didn't share his sense of urgency or bias towards intervention. But of course, regardless of patients' expectations, intervention isn't always the best clinical decision.

**Iatrogenesis and The Death of Two Presidents**

On a hot July day in 1881, President James Garfield was shot twice in the back by a troubled political activist, Charles Guiteau, while boarding a train in Washington, D.C. One of the bullets became lodged in his retroperitoneum between the spine and pancreas.

A comedy of what would now be considered misguided attempts to remove the bullet ensued. Over the subsequent days and weeks, the well-meaning doctors attending to Garfield—who were among the most respected of their time—proceeded with multiple failed efforts to retrieve the bullet using unwashed hands and unsterilized instruments. After all, the then recent and controversial work of Joseph Lister on antisepsis had yet to meet widespread acceptance.[1] The president was taken to New Jersey for some reprieve from the summer heat of D.C. where he died of complications of sepsis—79 days after being shot.

Most medical historians believe Garfield, a robust 49-year-old man, would have likely survived the shooting had the bullet just been left in place.[2] However, his doctors clearly believed that intervening to remove the retained projectile was the most prudent course of action.

Roughly 80 years earlier, America's first president met his demise under the "care" of similarly well-intentioned physicians. In December 1799, George Washington developed acute throat pain and swelling that led to difficulties with swallowing, which was attributed to "quinsy"—the antiquated term for severe throat infections, such as peritonsillar abscess.

He initially asked a friend to assist him with a lancet to induce hemorrhage—a widely accepted medical practice for a variety of ailments at the time—while awaiting medical assistance. When his team of doctors assembled, he continued to implore them to continue the blood-letting. They obliged. As was the case with Garfield, the doctors who tended to the former president were considered among the best in America at the time. But ultimately, their treatment proved more injurious than the infection itself. After draining over 2 liters of blood, Washington died the next day in his Mt. Vernon home.[3]

**Intervention Bias is a Two-Way Street**

Both of these examples demonstrate that the compulsion to act in the face of an acute medical issue can be driven by either party at the bedside. However, most commonly, there's collusion from both sides. And clearly this is not a novel phenomenon.

Retrospectively, it's obvious that both plans of treatment for our presidents were misguided. But these were serious situations, so the urge to intervene was seemingly justified. As Hippocrates acknowledged, "extreme remedies are only appropriate for extreme diseases." I wonder, however, how the presidents' outcomes may have changed had anyone involved considered and advocated for less aggressive interventions? Or perhaps for no interventions at all?

The phenomenon of "intervention bias" among clinicians has been extensively discussed in the medical literature,[4,5] however, patients' influence on these decisions made by clinicians to take action have largely remained unexplored. Authors cite reasons for clinicians' tendency to favor intervention when at a point of apparent equipoise ranging from financial incentives to defensive practice.[4]

However, patients are not simply passive bystanders when clinicians are making decisions about whether or not to intervene. Certainly in UC, where patients usually present with mild and short-term symptoms, their mere presence in the center is tantamount to a declaration that they are of a belief—albeit often an unconscious one—that medical intervention is indicated.

This common response among patients when new symptoms arise shouldn't surprise us. Every TV medical drama has a scene where a patient comes into the ED complaining of chest pain. And what happens next? A careful history and review of the patient's chart? Certainly not.

Instead, the patient is rushed to a resuscitation room and placed on all manner of monitors. Intravenous fluids and high-flow oxygen are started, and occasionally, the nurse even begins eagerly rubbing defibrillator paddles together. And this makes sense for entertainment value. Watching a tech obtain an EKG while a patient tries to gobble and chew several baby aspirin from a paper med cup wouldn't garner the same ratings.

The problem, however, arises when patients compulsively pursue aggressive care due to the conviction that aggressiveness is a surrogate for "good medicine." This belief that "more care equals better care" is compounded when we as healthcare professionals get psychologically drawn into such inappropriate strategies as well.

**Respecting Natural History and Iatrogenesis**

In the 21st century, consideration of the "natural history" of diseases is often relegated to more of a historical curiosity. The term conjures images of neurosyphilis and leprosy for many of us. But natural history is a critical concept to consider when treating patients with almost every common UC presentation from bronchitis to urinary tract infections (UTIs) to low back pain.

In an era of open MRI scanners ,"big gun" antibiotics, and COX selective anti-inflammatories, it's easy to forget that none of these conditions—or virtually any of the other most common UC diagnoses—were ever among the leading causes of human mortality. Sure, patients feel better faster if they start nitrofurantoin at the first sign of cystitis. However, even before the era of antibiotics, patients certainly got UTIs frequently, yet history isn't filled with cases of urosepsis-related deaths that started as bladder infections in otherwise healthy adults. And we know most acute back pain just gets better with time, and bronchitis usually subsides on its own within a few weeks.

In recent decades, the Choosing Wisely campaigns, supported by numerous high-quality studies, have advocated even greater prudence for the decision to delay or even avoid antibiotics for the most likely self-limited infections (eg sinusitis, bronchitis, acute diarrhea etc.).[6] This is based on an appreciation for the natural history of these illnesses and a careful review of the abundant data supporting the inutility of antibiotics to improve upon the body's innate ability to defend itself in the face of these common infectious conditions.

If we look at the definition, natural history describes the expected course of an illness without medical intervention. For self-limited conditions, their natural history is full recovery, and it's hard to improve upon complete resolution. Conversely, iatrogenesis is defined as the risks of harm related to medical interventions and represents the fifth-leading cause of death worldwide.[7] These are the two competing hazards we must always consider: the risk of a poor outcome if we elect not to intervene versus the risk of the intervention itself.

In weighing this balance, considering the deaths of Presidents Washington and Garfield can again be instructive. In both cases, the immediate issues they faced were undoubtedly life-threatening, and it's easily conceivable that they both might have died with or without the hazardous interventions.

However, it's important to also recognize that the belief in the potential benefit of many therapies is frequently recast when more evidence emerges (eg Lister's work on antisepsis). This is called a "medical reversal," and it is not limited to such seemingly barbaric practices of a bygone era. For example, stenting of significant, but stable, coronary artery occlusive disease was the standard of care until the early 2000s. Then more evidence emerged showing that patients were, on average, more likely to be

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harmed by this practice.[8]

If you've been practicing more than a decade or so, you probably can recall at least a few examples of medical reversals that you've witnessed. In the decade or so that I've been practicing in UC, I've seen the "best practices" change with respect to concussion management, immobilization after ankle sprain, and blood pressure goals in the elderly, just to a name a few. In other words, medical treatments we previously thought would be helpful are commonly proved more likely to be harmful. This is why the play on the familiar axiom is not only pithy but often sage clinical advice: "Don't just do something, stand there."

**Spectrum of Disease in Urgent Care**

One of the principle questions of medical research is generalizability. A clinical study is done on a group of patients in Ireland or Indonesia, and we are left to extrapolate how those results apply to the patient sitting in front of us in Illinois or Indiana. Generalizability isn't limited to geographic or ethnic differences though. In UC practice, the major issue with generalizability is that there are extremely limited data published on patients presenting to UC settings, so we are forced to look to studies conducted in other settings and specialties. In many ways, this question of extrapolation is harder.

When evaluating patients, we use our history, vital signs, physical exam maneuvers, and ancillary tests to whittle down a differential diagnosis and exclude dangerous conditions. Our ability to do this relies on some understanding of the risk of certain illnesses within the populations we see in our UC centers.

For example, if we are seeing a patient with lower abdominal pain who has some mild tenderness to palpation at McBurney's point, we seek to know the risk that the patient has appendicitis. However, since there are no published studies on the prevalence of appendicitis among patients presenting to UC centers, we are left to make assumptions based on studies published in emergency medicine (EM) and primary care literature.

This leads to a phenomenon called "spectrum bias," whereby we inappropriately assume our patients are similar to a different set of patients, and therefore that they have similar risk of certain illnesses.[9] Since there are limited studies in UC populations, if we rely on EM derived clinical decision rules (eg NEXUS, PERC, HEART score, etc.), which are likely excessively conservative for most ambulatory populations, we are likely to over-refer patients to the ED. Unfortunately, in UC, our only alternative is relying on our own arsenal of clinical experience until we have more published data.

Additionally, as UC is designed to offer highly convenient access, many patients present very early in their course of illness. How often have you seen patients with seven hours of ear pain or two hours of eye irritation? This further shifts the spectrum of disease towards presentations that are even less likely to represent dangerous clinical entities. Think about it. If such rapidly accessible care didn't exist, many of these patients would never have sought medical attention at all. Given the test of time, it's likely (but unfortunately far from proven) that many, if not most, patients presenting to UC would return to their normal state of health without treatment.

In these settings, however, the patients are more commonly presenting because they're seeking action more than reassurance. This leads to a final issue contributing to interventionism worth noting: overdiagnosis.[10]

Undoubtedly, there are some patients with hours of otalgia or eye discharge who truly do have bacterial otitis or conjunctivitis, but most don't. By prescribing an antibiotic immediately at this index visit, we not only risk overtreatment by virtue of overdiagnosis at the index visit, but we also tacitly encourage patients to seek care with similar alacrity the next time a similar condition arises. It's a deeply fundamental issue for quality and safety in UC actually. Many patients firmly believe that more testing and prescriptions and referrals are better, but paradoxically, the truth is quite the opposite. And this is probably more true in UC than in any other specialty.

**A Middle of the Road Approach**

While the prospect of delaying imaging studies for back pain or antibiotics for generally self-resolving infections is anathema to many UC patients who seek care out of frustration over bothersome symptoms, it shouldn't be for us. In taking the Hippocratic Oath, we vowed to "first do no harm," not "first disappoint no patient." It's important to remember this when we are faced with a patient request for some action, especially if the benefits of intervening are dubious. Remember that there are always risks of iatrogenesis associated with everything we do to patients and, in UC, these often outweigh the risks of delaying testing or treatment.

If the natural history of most urgent care presentations is full recovery without treatment—which I believe is true for most UC practices—on average, we hold much more potential to harm patients than help them. With the risks of iatrogenesis, rising costs of medical care, and the self-limited nature of most mild, acute symptoms, when faced with uncertainty, rather than first asking ourselves, "what should I do?" we'd better serve our patients if we asked a different set of questions:

1.) What is the likelihood of a serious diagnosis?
2.) What happens if I do nothing?
3.) What does the patient expect, and what's the risk of

harm associated with it?

4.) What alternate plan can I offer that's safer?

With some practice, I've found this approach can be well received by patients. Moreover, care ultimately becomes more efficient with this approach too; I'm no longer waiting on unnecessary x-ray reads or changing prescriptions that I didn't think would help in the first place.

In short, I've found many patients are accepting of wait-and-see strategies, provisional diagnoses, and metered reassurance, but only if we are able to put them at ease. If our patients are going to be comfortable with a non-interventional approach, we must first develop comfort within ourselves with the magic art of doing nothing. ■



**Joshua W. Russell, MD, MSc, FCUCM, FACEP**
Editor-in-Chief, *JUCM, The Journal of Urgent Care Medicine*
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CLINICAL

15 **Differentiating Acute Conjunctivitis Presentations in Children**

When children present in the urgent care with conjunctivitis, or "pink eye," clinicians must distinguish between viral and bacterial cases. Daycare rules, school policies, and parents who want a quick resolution might influence the decision whether to prescribe antibiotics. Refresh your best-practice approach to pediatric conjunctivitis.

*Julian P. Ponsetto, MD*
*Momoko K. Ponsetto, MD*

PRACTICE MANAGEMENT

27 **Worksite Clinics: Another Competitor or a New Opportunity for Urgent Care?**



The growing number of on-site, near-site, and shared-site health clinics delivering care to employees at work represents another level of market competition as well as a fresh opportunity for growth.

*Alan Ayers, MBA, MAcc*

CASE REPORT

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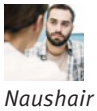


Consider travel history and intracranial causes for headache patients presenting with acute psychiatric symptoms.

*Naail Tariq, Cavan Scheetz, Michael B. Weinstock, MD*

CASE REPORT

35 **When a Bleeding Hemorrhoid Is a Sign of Something More Sinister**



Careful discovery helps identify when isolated bleeding is related to a more serious condition, as was the situation with this case of acute lymphoblastic leukemia.

*Naushair Hussain, Ahmad Ali, Michael B. Weinstock, MD*

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# JUCM CONTRIBUTORS

Just about every parent has taken their teary-eyed child to a provider with a suspected case of conjunctivitis. In fact, the condition is so common, it has earned its own familiar moniker of "pink eye." Schools and daycare centers have built policies regulating when a child with pink eye must stay home because of its potentially contagious nature.

However, this month's cover article, Differentiating Acute Conjunctivitis Presentations in Children (page **15**), challenges clinical teams to understand the distinction between viral and bacterial cases, not only for the sake of delivering appropriate treatment but also to avoid antibiotic overuse.

**Julian P. Ponsetto, MD,** Pediatrics, from Legacy GoHealth Urgent Care, in Portland, Oregon, and **Momoko K. Ponsetto, MD,** from the Department of Ophthalmology of the Casey Eye Institute, Oregon Health and Science University, also in Portland, outline the factors to consider. The article covers common pathogens that cause infectious conjunctivitis in kids and discusses exam findings that help differentiate viral and bacterial etiologies in addition to other causes of eye redness.

Case reports are always interesting stories revealing both the art and science of modern medicine. **Naail Tariq**, a student at the DeBusk College of Osteopathic Medicine, Lincoln Memorial University, and **Cavan Scheetz**, a student at the Heritage College of Osteopathic Medicine, Ohio University, present an ambitious case report about a man with a seemingly benign headache. The case becomes more complicated with the observation of paranoid delusions and the patient's later presentation in the emergency department after having multiple seizures. You'll see how patient travel can be a pivotal piece of information in Headache and Paranoid Delusions: A Case Report of Missed Neurocysticercosis (page **31**). Author **Michael Weinstock, MD,** Adena Health System, Wexner Medical Center at The Ohio State University, and JUCM Clinical Editor, also authored the case report.

Isolated bleeding is discussed in When a Bleeding Hemorrhoid Is a Sign Of Something More Sinister (page **35**). In this case report, the patient had symptoms of an upper respiratory infection and was concerned about a stiff neck and back. He also pointed out a rash on his back, arms, and legs. When a longer list of differentials was considered, clinicians in this situation arrived at a diagnosis of acute lymphoblastic leukemia. Read the case to see how they progressed in their thought process. **Naushair Hussain** and **Ahmad Ali**, both fourth year medical students at Pikeville Kentucky College of Osteopathic Medicine, investigated the case at Adena Regional Medical Center in Chillicothe, Ohio. **Dr. Weinstock** also authored the case report.

As employers take on increasing financial responsibility for employee healthcare, large organizations have adopted worksite clinic models. **Alan A. Ayers, MBA, MAcc,** president of Experity Consulting, explains the variety of options and how urgent care operators might adjust strategic focus based on this growing trend in Worksite Clinics: Another Competitor or a New Opportunity for Urgent Care? (page **27**). Ayers notes that when conducting a market analysis, operators must realize a percentage of their assumed "serviceable patients" might actually be accessing care for free at work, and thus would be less likely to drive to an urgent care center. On the other hand, operators with extra capacity might explore a worksite care model of their own as a new partnership venture with local employers.

**Phyllis Dobberstein, CPC, CPMA, CPCO, CEMC, CCC,** the RCM Compliance Manager for Experity, contributes her perspective on the 2024 update of the ICD-10-CM codes, which went into effect on October 1, 2023. She explains in detail just a few of the nearly 450 code changes, noting that most will have minimal impact on urgent care. Pneumonia, tachycardia, appendicitis, and codes for caregiver non-compliance with a treatment plan are covered. What's interesting is the fact that this 10th version of the international code set is now more than 25 years old, and the World Health Organization released ICD-11 in January 2022. The United States has been using a modified version of ICD-10—and several other countries do too—with little discussion so far about transitioning to ICD-11. Don't miss Dobberstein's practical outline of the latest ICD-10-CM codes.

Our longstanding information synthesizer, **Ivan Koay, MBChB, MRCS, FRNZUC, MD,** remains vigilant in relaying relevant literature and its significance. This month, he covers sampling methods for sexually transmitted infections as well as the use of the PEN-FAST tool to identify patients with very low risk of true penicillin allergy who are candidates for oral penicillin challenge. Dr. Koay is an urgent care physician and medical lead, Kings College Hospital Urgent Treatment Centre, London; Convenor Ireland and UK Faculty of the Royal New Zealand College of Urgent Care; and Independent Assessor European Reference Network, Andalusian Agency for Healthcare Quality. Abstracts in Urgent Care begins on page **22**.

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# Keeping an Eye on Scope Creep

Lou Ellen Horwitz, MA

I'm assuming you saw news stories last month with headlines like this: "Walmart and Other Drug Stores Want to Help You Skip Trips to the Doctor." Walmart Health is set to open 28 new locations in the coming year. Consumers can get testing and treatment for strep, flu, and COVID-19 at a Walmart pharmacy in 12 states, at Walgreens in 13 states, and at CVS in 10 states. Rite Aid is working on it, too.

The retail pharmacy industry is certainly taking the new state laws on pharmacists' scope of practice out for a spin. The pricing at Walmart is reportedly $70 for the "exam" and between $59 and $88 per test. Walgreens is doing a two-in-one flu/COVID-19 test for $20 plus $50 for the assessment.

According to the article I read, there's been less progress at the federal level on pharmacist scope of practice. The Centers for Medicare and Medicaid Services (CMS) isn't onboard. They currently don't recognize pharmacists as providers, so there's no Medicare coverage for these visits. That said, there's already a bill in the U.S. House to get them covered. We are watching this closely, particularly because if federal programs allow pharmacists to prescribe, shouldn't they allow Urgent Care centers to dispense?

**Acuity Degradation**

When we first started talking about acuity degradation in April 2022, our discussions focused on ourselves. What can or should we be doing to prevent such degradation, even though the financial realities are currently stacked against us? Investing in improving onboarding and ongoing training is a cost that's hard for Urgent Care centers to support when our margins keep getting squeezed from all sides.

One year later, we are seeing some signs of turning that trend around—especially since we've developed the resources to make it easier for you to do so: For example, our training partnerships with Hippo and Control the Dose.

What we didn't talk about was the other reason that acuity improvement is important: Everyone else is gunning for the lower-acuity visits. We see it with telehealth, health apps, home testing, and now in pharmacist scope creep. With leadership shifts at companies like Walgreens, strategies are changing quickly.

The good news is that problems in healthcare aren't solved quickly. That's good for us because we are more nimble and flexible than most, and patients love Urgent Care. It's undoubtable that at some point we are going to have true competition. Perhaps Walmart will figure out its niche this time, although its latest foray looks a lot like Urgent Care to me. Likewise, it's also undoubtable that the smartest people in healthcare, the ones reading this column, are going to be the ones to get us from where we are to where we need to be—over and over again.

But the margin problem still remains, and I want to share what we are doing about that. As you know from my past columns, the Urgent Care Association has engaged the lobbying firm McDermott Plus, and we've been working with them and our volunteer leaders to refine our messages. We've looked at changing the definition of POS-20, requiring certification, and the mechanisms that influence how you are paid to see which levers we should pull on and in what order.

We've also been working on determining the best audiences in Washington to pitch and in what order, so we can use our influence in the most effective ways. It's taken awhile, but by the time you read this, we will have had our first meeting with CMS and gained a good sense of our best path forward—or if we have to pivot.

Additionally, we are going to overhaul our advocacy webpage and email communications to better keep you in the loop on what we are doing. Right now, our primary messaging is focused on Urgent Care's sweet spot for cost reduction: keeping people out of the emergency room. It's not a big leap to see how important the reversal of acuity degradation is to that argument.

That said, we need your support in doing all that you can to work on degradation in your centers if it's an issue. We also need your support financially so we can keep working with McDermott Plus to stay in front of these critical audiences.

By now, you have started to see information on our new UCAdvocate fundraising program. Consider being part of that so we can keep doing our policy work. ■



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

# CONTINUING MEDICAL EDUCATION

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# CONTINUING MEDICAL EDUCATION

*JUCM* CME subscribers can submit responses for CME credit at **www.UrgentCareCME.com**. Quiz questions are featured below for your convenience. This issue is approved for up to *3 AMA PRA Category 1 Credits™*. Credits may be claimed for 1 year from the date of this issue.

## Differentiating Acute Conjunctivitis Presentations in Children (Page 15)

1. **What percentage of urgent care visits are diagnosed as conjunctivitis ("pink eye")?**
   a. 2.7%
   b. 20%
   c. 30%
   d. 40%

2. **All of the following are non-infectious causes of red eye except:**
   a. Dry eyes
   b. Allergic conjunctivitis
   c. Corneal abrasion
   d. Viral conjunctivitis

3. **Which of the following may be symptoms of patients with infectious conjunctivitis?**
   a. Discharge
   b. Photophobia
   c. Tearing
   d. All of the above

## Worksite Clinics: Another Competitor or a New Opportunity for Urgent Care? (Page 27)

1. **What percentage of employee health expenditures are paid by employers?**
   a. 78%
   b. 82%
   c. 86%
   d. 91%

2 **Why should you examine worksite clinics in a competitive analysis?**
   a. To share electronic data
   b. To refine your total serviceable market figure
   c. To add the patients to your mailing list
   d. To recruit new medical assistants

3. **Which of these models is *not* considered a worksite care option?**
   a. On-site
   b. Near-site
   c. Shared-site
   d. Distant-site

## Headache and Paranoid Delusions: A Case Report of Missed Neurocysticercosis (Page 31)

1. **In patients with a headache, which of the following are red flag symptoms?**
   a. Fever
   b. Neurologic deficits
   c. Papilledema
   d. All of the above

2. **Which of the following should be included in the differential of patients with a headache and new onset paranoia?**
   a. Migraine headache
   b. Tension headache
   c. Brain mass
   d. Cluster headache

3. **Cysticercosis is a:**
   a. Bacterial infection
   b. Viral infection
   c. Inflammatory condition
   d. Parasitic infection

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# Differentiating Acute Conjunctivitis Presentations in Children

Julian P. Ponsetto, MD and Momoko K. Ponsetto, MD

**Urgent message:** Make the distinction between viral and bacterial conjunctivitis to ensure children receive appropriate treatment and to avoid the negative consequences of antibiotic overuse.

**Citation:** Ponsetto JP, Ponsetto MK. Differentiating acute conjunctivitis presentations in children. *J Urgent Care Med.* 2023;18(1):15-20

Infectious conjunctivitis or "pink eye" is common in the pediatric population, accounting for 2.7% of diagnoses in pediatric urgent care.[1] However, it can be difficult to distinguish viral from bacterial disease, and it's important to not presume the cause is infectious. Additionally, some schools and daycares have mandates requiring children with pink eye to stay home or even receive antibiotic treatment prior to returning.

Difficulty in making a clinical distinction between viral and bacterial conjunctivitis and the desire to get children back to school leads many prescribers to write for topical antibiotics in most, if not all, cases of infectious conjunctivitis. However, antibiotic use is ineffective against viral conjunctivitis, and the extent of its benefit in most forms of bacterial conjunctivitis appears marginal. Overuse of antibiotics leads to bacterial resistance, unnecessary expense, and added stress in attempts at administration for young children and their caregivers.

This article reviews the common pathogens that cause infectious conjunctivitis in children and adolescents and discusses the history and exam findings that help differentiate viral and bacterial etiologies, as well as other causes of eye redness.



## Non-Infectious Etiologies Of Red Eye

While infectious conjunctivitis is the most common cause of eye redness in children, it is important to differentiate eye redness and/or eye discharge from the non-infectious causes. These include:

- Allergic conjunctivitis – Characterized by tearing, burning, itching, and conjunctival edema (chemosis) with conjunctival papillae on lid eversion. Allergic conjunctivitis is often associated with rhinitis but lacks fever and lymphadenopathy.[2]
- Chemical eye injury – Characterized by redness, pain, and swelling after splashes of irritating or

**Author affiliations: Julian P. Ponsetto, MD,** Pediatrics, Legacy GoHealth Urgent Care, Portland, OR. **Momoko K. Ponsetto, MD,** Department of Ophthalmology, Casey Eye Institute, Oregon Health and Science University, Portland, OR. Authors have no relevant financial relationships with any commercial interests.

toxic chemicals. Depending on the chemical, concentration, and exposure, this can be vision-threatening. Especially in the case of extreme pH acidic or alkali exposure injuries, the exposure can be a medical emergency. An exposure history is usually suggestive for considering this diagnosis.[3]

- Corneal abrasion and/or foreign body – Characterized by severe pain, redness, tearing, and photophobia after a traumatic injury or contact lens use. With more significant abrasions, patients may be resistant to eye opening. Globe rupture can occur. Pain is usually relieved with application of topical anesthetic.[4]
- Nasolacrimal duct obstruction – Commonly presenting in the first year of life, this condition occurs when the nasolacrimal duct is incompletely formed/patent. Patients will present with excessive tearing (epiphora) without redness, which may worsen when suffering from an upper respiratory infection. If redness, purulent discharge, or swelling appear around the medial canthus, this is suggestive of concomitant dacryocystitis.[5]
- Dry eyes – This condition is characterized by chronic eye irritation and occasional conjunctival infection. This can commonly occur postoperatively and in contact lens wearers. Rarely, dry eyes can be related to autoimmune disease, such as Sjogren's syndrome.[6]
- Uveitis – Also commonly referred to as "iritis," uveitis is caused by inflammation along the uveal tract (iris, ciliary body, and choroid). Uveitis is characterized by eye pain, photophobia, and "ciliary flush" pattern of redness surrounding the iris predominantly. While this can occur from blunt ocular trauma, it's most commonly idiopathic (60% of cases), and the remaining cases are often associated with autoimmune disorders (eg, Behçet's disease or most commonly juvenile idiopathic arthritis).[7]

## Differentiating Between Bacterial and Viral Infectious Conjunctivitis

Presentation of infectious conjunctivitis is variable and nonspecific and can include discharge, conjunctival erythema, photophobia, itching, burning, tearing, and foreign body sensation. Severe pain, vision changes, and/or significant photophobia suggest a different and more concerning etiology. Classic clinical presentations of the various etiologies of conjunctivitis are rare, and patients tend to have overlapping constellations of signs and symptoms.

Since patients can have some or all of these symptoms in either bacterial or nonbacterial disease, it's important to look closely at differentiating factors to make the most accurate diagnosis. Illustrating this point, a study of patients with culture-positive bacterial conjunctivitis found: 58% had itching; 37% had bilateral involvement; and 35% had serous or no discharge.[8]

Among all pediatric patients with conjunctivitis, a bacterial pathogen can be cultured about 50% of the time, although culture is not recommended as part of routine practice, as it would rarely change practice or affect outcomes.[9] The variables most associated with having a negative bacterial culture were: 1) age 6 years and older; 2) no glued or matted eyes in the morning; 3) no discharge or watery discharge; and 4) presentation in April through November. Patients fulfilling all 4 of these criteria rarely had positive cultures, whereas presence of mucoid or purulent discharge and matted eyelids predicts a >95% risk of positive bacterial culture.[10]

A practical approach for the urgent care provider to differentiate bacterial and viral conjunctivitis may include the following:

- Visual acuity or "the vital sign of the eye" – Age-appropriate assessment of visual acuity is crucial in any vision or eye complaint. Conjunctivitis does not cause changes in visual acuity. Altered vision should prompt consideration for other etiologies of redness in the eye.[9]
- Eye discharge – Bacterial conjunctivitis is more commonly associated with purulent eye discharge, especially if it persists throughout the day. While both bacterial and viral disease can cause the affected eye(s) to be "stuck shut" in the morning, the absence of discharge or the stuck-shut finding makes viral disease much more likely, especially when associated with other viral symptoms (eg, fever, cough, etc.).[8]
- Unilateral vs bilateral disease – While bacterial disease is more classically unilateral, both bacterial and viral disease can cause either unilateral or bilateral disease. Since the urgent care evaluation is a single point in time, it is difficult to extrapolate etiology from the disease laterality. Viral conjunctivitis frequently starts with redness of one eye, but the second eye often becomes involved in 24-48 hours.[11]
- Patient age – Bacterial conjunctivitis is more common than viral etiologies in children, especially in infants, toddlers, and preschool age children. The younger the patient, the higher the likelihood of bacterial etiology.[12]
- Conjunctival exam – A papillary reaction in the

**Figure 1. Papillary conjunctival response.**



(Image courtesy of American Academy of Ophthalmology Multimedia Images.)

**Figure 2. Follicular conjunctival response.**



(Image courtesy of American Academy of Ophthalmology Multimedia Images.)

conjunctiva can appear as flattened nodules, which are vessels surrounded by acute and chronic leukocytes (**Figure 1**). This is more common in allergic conjunctivitis. In contrast, a follicular reaction in the conjunctiva appear more as dome-shaped nodules, which are a core of lymphocytes and mononuclear cells (**Figure 2**). Follicular reaction is more common in infectious conjunctivitis. These exam findings are best elicited with careful inspection of the conjunctiva and the fornices. Use of a fluorescein stain with a Wood's lamp, especially in an urgent care setting where a slit lamp may not be readily accessible, can be helpful in highlighting these conjunctival changes.[11]

- Other exam findings – Relative to bacterial conjunctivitis, viral disease is more commonly associated with other systemic symptoms such as fever, adenopathy, and pharyngitis; however, eye redness may be the only manifestation of disease. A small, tender preauricular lymph node may be suggestive of adenovirus.[9] As herpes simplex virus (HSV) and varicella (VZV) can cause conjunctivitis but also keratitis, a careful examination of the surrounding eyelid and skin for vesicles and dendritic fluorescein staining pattern can be useful in differentiating among HSV, VZV, and other viral causes.[9] Bacterial conjunctivitis may be associated with local bacterial disease as is common in the conjunctivitis-otitis syndrome.[13]

## Epidemiology

A prospective study of children aged 6 months to 17 years seen in an urban pediatric emergency department (ED) with conjunctivitis found that bacterial culture was positive in approximately 65% of cases, with *Haemophilus influenza* and *Streptococcus pneumoniae* the most frequently isolated pathogens.[14] *Staphylococcus aureus* and *Moraxella catarrhalis* were also commonly identified. Viral causes of infectious conjunctivitis in children include *adenovirus* (often associated with fever and pharyngitis) but also *coxsackie* and *enteroviruses* among others.

## Treatment

In cases in which viral etiology is highly suspected (ie, older children, bilateral disease, watery discharge, significant itching, etc.) treatment is supportive with preservative-free artificial tears for comfort as needed and observation at home.[11] The focus should be on preventing spread of disease using good hygiene and some isolation.

In cases in which routine bacterial etiology is highly suspected, treatment with topical antibiotic therapy is recommended. However, it is worth noting that most forms are self-limited, and vision-threatening outcomes are exceedingly rare. In one study, 86% of children given antibiotic drops had resolution of symptoms by day 7, compared with 83% of children given a placebo drop.[15]

Resolution of symptoms, even among cases of bacterial conjunctivitis, seems only marginally accelerated with the use of antibiotic drops. In a recent Finnish study, children treated with moxifloxacin drops had resolution of symptoms in 3.8 days vs 4.0 days in children treated with placebo (carboxymethylcellulose drops). Interestingly, patients receiving no treatment took the longest for clinical recovery (5.7 days).[16] This finding suggests there may be an irrigation or "washout effect," as prior studies have also demonstrated similar

times to resolution between antibiotic and placebo eye drops.[15]

In cases that are ambiguous and mild, a watch-and-wait approach is reasonable. This practice has been found to reduce antibiotic use without significantly altering outcomes. While more rare and mild, adverse reactions still occur 5-10% of the time with use of antibiotic eye drops.[12] There are also more practical considerations for delaying/avoiding immediate antibiotics, including financial and logistical burdens for caregivers to pick up the prescription, as well as frustrations and emotional trauma surrounding the administration of eye drops or ointments in younger children.

*"It has been shown that only half of the delayed antibiotic prescriptions are filled, and there is only an approximately 12-hour difference in time to resolution of symptoms when using this approach."*

The wait-and-see approach, for parents who are agreeable, entails writing a prescription for topical antibiotic but recommending that it be filled only if symptoms persist or worsen after 72 hours. While this practice may make some parents nervous, it is highly improbable that this delay will affect any long-term outcome. It has been shown that only half of the delayed antibiotic prescriptions are filled, and there is only an approximately 12-hour difference in time to resolution of symptoms when using this approach. Delayed prescribing options also can allow providers to discuss the clinical course and self-resolving nature of conjunctivitis which has led to improved patient satisfaction and decreased revisits for conjunctivitis.[17]

For patients and families in which the child's return to school or daycare is the primary concern, it is not unreasonable to start immediate topical antibiotic therapy, though discussion of the limited treatment benefit and self-resolving nature of conjunctivitis is encouraged.

### Antibiotic Selection

The most common causative organisms in cases of bacterial conjunctivitis are similar to those expected for otitis media: *H influenzae, S pneumoniae,* and *M catarrhalis*. While resistance may exist among these organisms at varying rates depending on geography, the clinical implications of this are uncertain, and resolution does not seem to be meaningfully affected by antibiotic selection in cases of uncomplicated conjunctivitis.[17]

Outside of special situations (eg, neonatal, contact lens use, etc.) antibiotic recommendations are generally based on expert opinion; therefore, practical considerations should be taken into account. For example, frequency of dosing and ointment vs drop formulation can make a significant impact on both the patient's and parents' experience of treating the infection. Additionally, the cost of various ophthalmic antibiotic preparations can vary significantly.

Since most cases of bacterial conjunctivitis will resolve quickly without long-term sequelae, if using an antibiotic, it's preferable to choose the most logistically practical agent. Reasonable first-line options include trimethoprim-polymyxin B (Polytrim) drops or erythromycin ointment. Ointment is preferred, based mostly on expert opinion, for its ease of administration in smaller children.[18]

### Corticosteroids

Many ophthalmic antibiotic preparations exist in combination with a corticosteroid (eg, dexamethasone, prednisolone). It is important to note that ocular steroids can have significant adverse reactions and have no role in treating infectious or undifferentiated conjunctivitis. They may be rarely prescribed by an eye specialist as a later-line treatment for allergic conjunctivitis.[19] These agents are for symptom management only and should be deferred to an eye specialist rather than prescribed from urgent care.

## Special Cases And Considerations

### Neonatal Conjunctivitis

Conjunctivitis in an infant under 1 month of age is referred to as *ophthalmia neonatorum*. Vertical transmission of *N gonorrhoeae* (NG) and *C trachomatis* (CT) are of concern, though incidence has decreased in the U.S., primarily due to routine screening and treatment of pregnant mothers. Prophylaxis for neonatal conjunctivitis with topical erythromycin administered after birth is considered standard of care, though this is thought to be only effective in reducing gonococcal transmission.[20]

Various other bacterial and viral pathogens may cause conjunctivitis in infants <30 days of age. Epidemiology of various pathogens in such cases varies widely. In general, it is advisable to obtain polymerase chain reac-

tion (PCR) testing for HSV, CT, and NG, as well as gram stain and culture in cases of conjunctivitis presenting in the first month of life. Maternal sexually transmitted infection history should also be obtained.[21]

The Centers for Disease Control and Prevention and American Academy of Ophthalmology recommend treatment of ocular CT, NG, and/or HSV infection in the neonate with appropriate systemic anti-infective agents.[22,23] Therefore, if immediate ophthalmologist consultation is not feasible, it is prudent to refer patients immediately to the ED as disseminated infection can occur and real-time identification of pathogens is generally not possible.

### Contact Lens Use

Children and adolescents with red eye and history of contact lens use warrant a distinct approach. Contact lens use can cause eye irritation and conjunctival infection due to alterations of tear production/dry eye. However, contact lenses can cause corneal hypoxia, as well, resulting in giant papillary conjunctivitis, corneal ulcer, neovascularization of the cornea, or keratitis. A fluorescein exam with UVB light (eg, Wood's lamp) is indicated in patients with painful or red eyes and history of contact lens use. Patients with corneal defects require prompt ophthalmology evaluation.[24]

Additionally, the material contact lenses are made of predisposes to gram-negative infection of the conjunctiva and cornea, particularly *Pseudomonas*. Prolonged use and inappropriate contact lens hygiene increase these risks. This has important implications for antibiotic selection. Fluoroquinolone (eg, ofloxacin, ciprofloxacin) or aminoglycoside (eg, gentamicin) ophthalmic drops are recommended in patients with conjunctivitis. Additionally, it is prudent to err on the side of antibiotic treatment and ensure that patients do not resume contact lens use until symptoms have entirely resolved.[9]

### Bartonella

Approximately 2-3% of patients with cat scratch disease from *B henselae* develop Parinaud oculoglandular syndrome.[25] Tender lymphadenopathy—especially preauricular, submandibular, and upper cervical lymph nodes—with a usually unilateral follicular conjunctivitis in the setting of recent exposure to cats (especially kittens) is characteristic of this condition.[26] A decrease in visual acuity may suggest neuroretinitis from *B henselae*. If suspected, obtaining serology is a reasonable first step. For titers, immunoglobulin M (IgM) ≥1:20 or immunoglobulin G (IgG) ≥1:256 are indicative of active disease.[27] These patients should be referred to ophthalmology and/or an infectious disease clinician for close follow-up and continued management.

### Herpes Simplex Virus

HSV typically presents as a follicular conjunctivitis with vesicles on the skin or eyelid margin. It is of particular concern in neonates born to a mother with an active genital HSV infection/outbreak. In older children, a history of cold sores can also be suggestive.[28] A dendritic staining pattern on the cornea can be seen in HSV keratitis, but may be present in as few as 15% of cases. Therefore, absence of ulceration or dendritic pattern should not be used to exclude this diagnosis.[29] Oral antivirals (rather than topical) should be initiated in cases in which there is suspicion of HSV conjunctivitis or keratitis.[30] These patients should be followed closely by an ophthalmologist given the potential for corneal scarring that can lead to amblyopia or astigmatism.[31]

## Back To School

Once a diagnosis of infectious conjunctivitis has been established, caregivers and clinicians should offer guidance as to when a child may responsibly return to the classroom or daycare. These concerns may be heightened since the COVID-19 pandemic, in which strict return-to-work and school protocols were widely recommended and implemented.

Unfortunately, the wide array of bacterial and viral pathogens that cause infectious conjunctivitis in children make specific or precise guidance difficult. Many common pathogens are spread via hand-to-eye contact (as well as via respiratory droplets) so handwashing, covering coughs, and maintenance of a clean classroom space should be encouraged. Both viral and bacterial causes are highly contagious in a school setting; however, the *AAP Redbook* recommends against excluding afebrile, otherwise healthy children with conjunctivitis from school or daycare given the mild and self-resolving nature of the illness.[32] More education should be offered to schools and daycares to avoid policies that exclude children with typical cases of infectious or undifferentiated conjunctivitis.

## Take-Home Points

- The vast majority of infectious conjunctivitis in children is self-limited, regardless of etiology.
- While many children present with parental concerns for "pink eye," it is important to maintain a complete differential and perform a thorough exam, as other causes of eye redness and discomfort can be vision-

threatening if missed.

- The first step in diagnosing infectious conjunctivitis is excluding noninfectious causes that have distinctly different management pathways.
- Viral conjunctivitis is suggested in patients with prodrome symptoms (eg, fever, pharyngitis, fatigue, etc.), age >6 years, lack of glued eyes, lack of purulent discharge, follicular reaction, preauricular lymphadenopathy, and/or frequent tearing.
- Bacterial conjunctivitis is suggested in patients with copious purulent drainage, young age, papillary reaction, and local suppurative symptoms (eg, otic conjunctivitis).
- Except in cases of contact lens use, antibiotic selection should be guided by practical considerations such as cost and ease of administration.
- In patients with mild bacterial disease or inconclusive infectious disease, a watch-and-wait approach is a reasonable option, depending on return-to-school considerations.
- Special considerations include neonatal conjunctivitis, contact lens use, Bartonella/history of cat scratch exposure, and HSV conjunctivitis, each of which requires specific management, often in conjunction with an ophthalmologist.

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# ABSTRACTS IN URGENT CARE

- Accurate Sample Types for STIs
- Further evidence for the PEN-FAST Tool
- Artificial Intelligence in Making Clinical Diagnoses
- Effects of Antibiotics and Children's Teeth
- VTE Risk Assessment of Immobilized Limb Injuries
- Predicting Occult Scaphoid Fractures

Ivan Koay, MBCHB, FRNZCUC, MD

## Which Sample is More Accurate for STIs: Vaginal or Urine?

**Take Home Point:** Vaginal swabs are the optimal sample type for women being evaluated for chlamydia, gonorrhea, and/or trichomoniasis.

**Citation:** Aaron K, Griner S, Footman A, et. al. Vaginal Swab vs Urine for Detection of Chlamydia trachomatis, Neisseria gonorrhoeae, and Trichomonas vaginalis: A Meta-Analysis *Ann Fam Med*. 2023 Mar-Apr;21(2):172-179. doi: 10.1370/afm.2942

**Relevance:** Many sexually transmitted infections (STI) are asymptomatic in women and can have serious consequences for morbidity and future fertility. Identifying the best method to accurately screen for and diagnose these infections enables earlier treatment and can curb the public health burden of these infections.

**Study Summary:** This was a systematic review of the evidence on the diagnostic assay sensitivity for female vaginal swabs compared to urine samples among commercial assays for Chlamydia trachomatis (CT), Neisseria gonorrhoeae (NG), and Trichomonas vaginalis (TV).

The authors identified 28 studies suitable for analysis. They found that vaginal swabs were more sensitive than urine for CT and NG. Pooled sensitivity estimates from the studies were 94.1% for vaginal swabs and 86.9% for urine specimens (P <.001) for CT detection. For NG, pooled sensitivity estimates were 96.5% for vaginal swabs and 90.7% for urine specimens (P <.001). The difference in sensitivity for the two sample types for TV detection was not statistically significant. The findings of this systematic review are in agreement with the present Centers for Disease Control and Prevention recommendations favoring vaginal swabs over urine as the optimal specimen type for both CT and NG detection.

**Editor's Comments:** The quality of the data of the meta-analysis, as with all systematic reviews, is reliant on the quality of the original publications. There was a lack of data regarding asymptomatic women in the analysis. The authors acknowledge that self-collected vaginal swabs are an appropriate, or even preferable, alternative to provider collected swabs especially if this decreases patient reluctance to testing. ■

## Is this Penicillin Allergy Real? Further evidence for the PEN-FAST Tool

**Take Home Point:** The PEN-FAST tool has been previously proposed as a simple clinical decision rule that can identify patients with very low-risk of true penicillin allergy and who are reasonable candidates for oral penicillin challenge.

**Citation:** Su C, Belmont A, Liao J, et. al. Evaluating the PEN-FAST Clinical Decision-making Tool to Enhance Penicillin Allergy Delabeling. *JAMA Intern Med*. 2023 Jun 20; e231572. doi: 10.1001/jamainternmed.2023.1572

**Relevance:** Penicillin allergy is the most commonly reported allergy, but 90% of penicillin allergies are spurious. Prior studies have shown that penicillin allergy puts patient at risk for increased healthcare spending and complications from antibiotics. PEN-FAST has been previously shown to be a useful tool for identifying low risk patients for true penicillin allergy.

**Study Summary:** This was a retrospective medical record



**Prepared by Ivan Koay MBChB, MRCS, FRNZCUC, MD**
Urgent Care Physician and Medical Lead Kings College Hospital Urgent Treatment Centre, London; Convenor Ireland and UK Faculty of the Royal New Zealand College of Urgent Care; Independent Assessor European Reference Network, Andalusian Agency for Healthcare Quality

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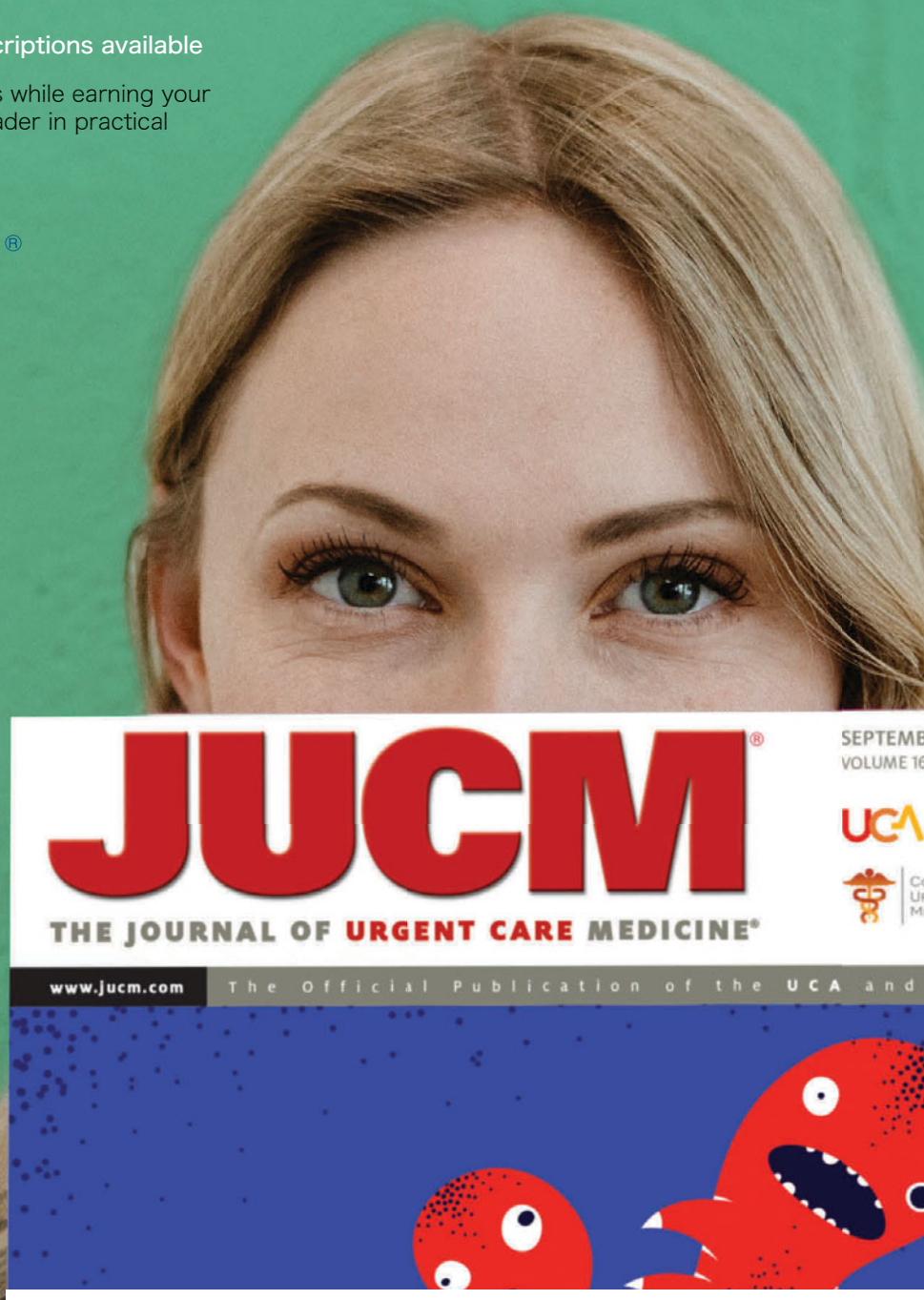
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*"How AI may be incorporated most safely and effectively into diagnosing illness remains undetermined."*

review of patients with reported penicillin allergies who underwent penicillin allergy testing in allergy and immunology outpatient clinics in a large U.S. tertiary referral healthcare system. Allergy testing consisted of skin prick and intradermal testing with oral challenge after skin testing or direct oral challenge (DC) without skin testing. Scores from PEN-FAST, a clinical decision-making tool, were compared with outcomes based on positive penicillin allergy test results. Sensitivity, specificity, negative predictive value (NPV), and positive likelihood ratio were calculated for each PEN-FAST score in predicting penicillin allergy, and the area under the receiver operating characteristic curve was calculated to assess overall diagnostic performance.

The authors reviewed 120 patient charts. They found that among patients who received oral penicillin challenge, all had PEN-FAST scores of 0 or 1. None of the patients with a score of 0 or 1 had immune- or non-immune mediated reactions. Some 73.3% of patients with PEN-FAST scores of 2 or less and all patients with scores <3 had negative test results. PEN-FAST had an NPV of 100% in identifying patients with a low-risk penicillin allergy history who could safely proceed to DC and penicillin allergy de-labeling.

**Editor's Comments:** Limitations of this study include its retrospective design, referral bias, and single study site, which may limit generalizability. However, the findings of this study support the previous and growing evidence validating that the PEN-FAST tool can identify patients at very low risk for true penicillin allergy and does offer an option for use particularly for urgent care providers with limited access to allergists. ■

### Artificial Intelligence in Making Clinical Diagnoses

**Take Home Point:** Generative artificial intelligence (AI) is a promising complement to human cognition and may soon prove to be a useful adjunct for clinical diagnosis.

**Citation:** Kenjee Z, Crowe B, Rodman A. Accuracy of a Generative Artificial Intelligence Model in a Complex Diagnostic Challenge. *JAMA*. 2023 Jul 3;330(1):78-80. doi: 10.1001/jama.2023.8288.

**Relevance:** AI has been shown to score highly on standardized medical examinations, but less is known about its ability to perform complex medical reasoning.

**Study Summary:** This was an experimental study by the authors to assess the accuracy of one such model (Generative Pre-trained Transformer 4 [GPT-4]) in a series of diagnostically difficult cases. They used the *New England Journal of Medicine* clinicopathologic conferences, which are challenging medical cases that conclude with a final pathological diagnosis and are used for educational purposes in the journal. The primary outcome of interest was whether the model's top diagnosis matched the final case diagnosis. Prespecified secondary outcomes investigated were the presence of the final diagnosis in the model's differential, differential length, and quality of the potential diagnosis list scored using an ordinal 5-point rating system. The authors found the AI model's proposed most likely diagnosis agreed with the final diagnosis in 39% (27/70) of cases. However, in only 64% of cases (45/70) did the model even include the final diagnosis in its differential. GPT-4 did provide a superior mean differential quality score compared with prior versions of similar AI (4.2 vs 3.8).

**Editor's Comments:** There was subjectivity in the scoring system due to the reliance on the authors scoring. There were also instances where important diagnostic information was not included in the AI prompt due to protocol limitations, likely leading to an underestimation of the model's capabilities. This is a promising start. However, how AI may be incorporated most safely and effectively into diagnosing illness remains undetermined. ■

### Effects of Antibiotics and Children's Teeth

**Take Home Point:** In this study, there was no evidence that newer tetracycline formulations (doxycycline and minocycline) at currently recommended dosages led to adverse effects on dental health.

**Citation:** Ravindra D, Huang G, Hallett K, et. al. Antibiotic Exposure and Dental Health: A Systematic Review. *Pediatrics*. 2023 Jul 1;152(1): e2023061350. doi: 10.1542/peds.2023-061350.

**Relevance:** Tetracycline and related antibiotics have long been cautioned against in pediatric patients due to concern over effects on dentition. However, this is a useful class of antibiotics, and it is not clear all tetracyclines have similar effects.

**Study Summary:** This was a systematic review to evaluate

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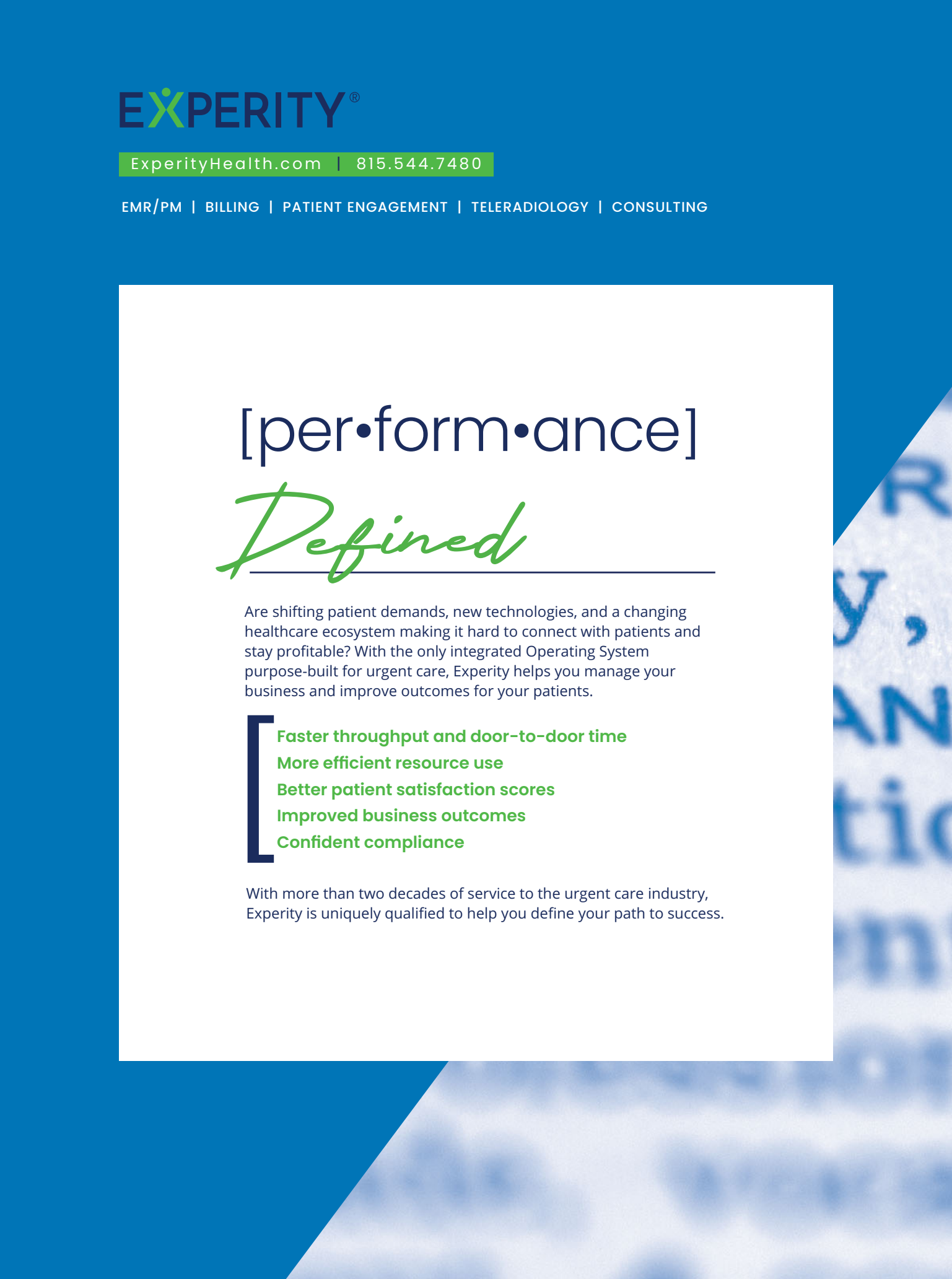
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the evidence regarding the effect of early childhood antibiotic exposure on dental caries, developmental defects of enamel, and tooth staining. The study followed the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) reporting guidelines.

The authors identified 34 retrospective studies eligible for analysis. 18 of these studies investigated tetracyclines and/or tetracycline derived antibiotics, 7 investigated amoxicillin only, and 9 did not specify the antibiotic class prescribed. The authors found tetracyclines at higher dosages (20 mg/kg per day) did, in fact, have an association with dental staining; these doses are not recommended. There was no evidence that newer tetracycline-related formulations (specifically doxycycline and minocycline), nor other antibiotic classes, were associated with adverse dental outcomes, however.

**Editor's Comments:** There was a lack of standardized and validated outcome measures—for tooth staining in particular—which limits the ability to compare studies within the identified literature. All studies were retrospective in design. With these caveats in mind, it does appear safe and reasonable to use a short course of doxycycline when it is the preferred/first line choice for treating a potentially significant infection in younger children (eg Lyme disease). ■

### VTE Risk Assessment of Immobilized Limb Injuries

**Take Home Point:** Incorporation of the Aberdeen venous thromboembolism (VTE) risk tool may help identify patients with lower limb immobilization that benefit from thromboprophylaxis.

**Citation:** Almoosawy S, Ofosu-Asiedu A, Hanna J, et. al. Venous thromboembolism risk following temporary immobilisation after injury: evaluation of the Aberdeen VTE risk tool. *Emerg Med J.* 2023; 40:361–368. doi:10.1136/emermed-2022-212723

**Relevance:** Lower extremity immobilization is known to increase the risk of VTE. Present guidance for risk assessment of VTE in patients with lower limb immobilization does not consider the mechanism of injury nor identify which patients would benefit from thromboprophylaxis.

**Study Summary:** This was a prospective single-center cohort design study based in the ED and fracture clinic in a large tertiary center in Scotland. The aim of the study was to evaluate the Aberdeen VTE risk tool's performance in routine clinical practice. The secondary aim was to compare the diagnostic properties of published risk assessment methods (RAMs). Adult patients (≥16 years) managed with temporary lower limb immobilization (rigid cast or removable semirigid splints of the ankle or knee but excluding plaster slippers or foot immobilizing shoes) were included.

*"This data is an important reminder that lower extremity immobilization confers a risk of VTE."*

During the study period, the Aberdeen VTE tool was applied in 2,194 instances. 1,763 patients (mean age = 46 years; 51% women) were included. The authors found the Aberdeen VTE risk tool identified roughly 60% patients as high risk. Symptomatic VTE occurred in nearly 1 in 100 patients, about half the baseline incidence with no thromboprophylaxis but similar to administering thromboprophylaxis to all casted patients regardless of risk. Twelve patients identified as high risk and who received LMWH thromboprophylaxis still developed symptomatic or fatal VTE. None of 392 patients immobilized for a foot fracture, a grade 1 or 2 knee or ankle sprain, or to protect a knee wound, developed VTE. The diagnostic performance of five RAMs in a secondary analysis of 1,695 patients. TRiP(cast) score ≥7 and a Plymouth score ≥3 recommended only 1 in 3 and 1 in 4 patients, respectively, for thromboprophylaxis. Overall comparison suggested that the TRiP(cast) score was the best RAM for the study population.

**Editor's Comments:** Many patients were managed in removable semirigid knee or ankle splints, which confer less VTE risk than rigid casting. Presence of VTE was ascertained from medical record rather than standardized clinical follow-up assessment. This data is an important reminder that lower extremity immobilization confers a risk of VTE (approximately 1% in this population), and higher risk patients benefit from thromboprophylaxis. Yet not all incidence of VTE is preventable even with these measures. ■

### Predicting Occult Scaphoid Fractures

**Take Home Point:** There is no single feature that satisfactorily excludes an occult scaphoid fracture, however, pain with passive supination was the most sensitive exam technique.

**Citation:** Coventry L, Oldrini I, Dean B, et. al. Which clinical features best predict occult scaphoid fractures? A systematic review of diagnostic test accuracy studies. *Emerg Med J.* 2023;0:1–7. doi:10.1136/emermed-2023-213119

**Relevance:** Missed scaphoid fracture can result in permanent osteoarthritis of the wrist. Diagnosing scaphoid fractures, particularly those which are subtle or occult on plain radiography, can be tricky. This study examines the clinical features that are most sensitive for excluding an occult fracture.

**Study Summary:** This was a systematic review of physical exam maneuver test characteristics on studies undertaken and reported according to the Preferred Reporting Items for Systematic Review and Meta-Analysis of Diagnostic Test Accuracy studies guidelines. Studies were included if they reported the accuracy of clinical findings for an occult scaphoid fracture among patients with normal initial radiographs but ongoing clinical suspicion of scaphoid fracture. Occult fractures were defined as any breach of the scaphoid cortex that was not visible on the initial radiographs. Eight articles were included in final analysis with reporting data on 1,685 wrist injuries and 123 occult scaphoid fractures. The most common tests were the scaphoid compression test in which pain occurs in the anatomical snuffbox (ASB) on longitudinal compression of the thumb (four studies, 1,321 participants), anatomical snuffbox tenderness (ASBT) (four studies, 1,309 participants), and scaphoid tubercle tenderness (three studies,1,256 participants).

The authors found pooled prevalence of occult scaphoid fractures among patients with a clinical suspicion, but normal initial radiographs were 9% (95% CI 5% to 13%), with high heterogeneity ($I^2$=91.4%). There was no evidence that clinical examination could safely confirm or exclude an occult scaphoid fracture. Only pain on supination by the examiner was sufficiently useful to inform clinical decision making (100% sensitive). However, this finding should be interpreted with caution as this clinical sign was only evaluated by a single study of 53 patients with 8 total fractures.

**Editor's Comments:** There was variability in defining occult scaphoid fractures within the papers reviewed. There was a long study span (34 years) of the papers reviewed during which time, there have been marked technological advancements made within plain radiography which need to be considered. Regardless, this lends further support for the practice of immobilizing patients with any concern for scaphoid fracture after wrist injury until occult fracture can be firmly excluded—usually through repeat x-rays or advanced imaging (eg MRI). ■





CME: This article is offered for AMA PRA Category 1 Credit.™
See CME Quiz Questions on page 13.

# Worksite Clinics: Another Competitor or a New Opportunity for Urgent Care?

**Urgent Message:** Employer worksite clinics represent both a threat and an opportunity. Urgent care could lose some volume to no-cost care at work, but new business evolutions include partnering with local employers to develop on-site care models.

Alan A. Ayers, MBA, MAcc

Patients today have more options for where they receive care than ever before, which means more competition for urgent care (UC) operators. As employers continue working to attract top talent with valuable benefits, on-site, near-site, and shared-site health clinics have gained in popularity as another care option.

According to a recent survey of large employers (defined as >5,000 employees), 72% expect to have a worksite clinic operational by 2023 with 60% offering worksite primary care services.[1]

As worksite clinics become more prevalent, urgent care must consider its response.



## What Is the Worksite Care Model?

Simply put, a worksite care model is where a self-insured employer pays for care directly at the workplace vs reimbursing for care provided in the community.

These clinics offer a range of services, which are customized based on the employer's needs and budget. Occupational medicine services are common, including drug screenings, physicals for duty and compliance, worker's compensation injury care, and physical therapy.

Even more common are primary care services for both employees and their dependents, along with lab testing and preventive care. This scope of primary care also includes episodic care, such as same-day virtual and in-person primary care appointments for sudden illness or injury. And some even go further to integrate specialists and create local referral networks.

For employers, on-site clinics reduce absenteeism due to illness and help lower health expenditures. Given that healthcare expenditures now exceed $15,000 per employee[2] —78% of which is paid by employers—employers can find savings in direct payment for services that emphasize preventive care.[2]

While many employees enjoy the convenience of having care close to work, others choose not to utilize a worksite clinic. Some cite concerns with privacy, while others want to maintain long-established relationships with community providers.

To increase participation, employers may gently steer employees using "carrots and sticks" in health plan design. For instance, the employer's insurance may offer

**Author affiliations: Alan A. Ayers, MBA, MAcc** is President of Experity Networks and is Senior Editor of *The Journal of Urgent Care Medicine*. The author has no relevant financial relationships with any commercial interests.

**Table 1: Staffing needed to operate an on-site clinic**

| Specialty | Hours per Week | Nurse Practitioner/ Physician Assistant | Medical Assistant | On-site Employees |
|---|---|---|---|---|
| Primary care and occupational medicine | 20 | 1 NP/PA | 1 MA | 400-500 |
| Primary care and occupational medicine | 40 | 1 NP/PA | 1 MA | 750 |
| Occupational medicine and workers compensation | 40 | 1 NP/PA | 1 MA | 2,000-2,500 |

Source: Experity Industry Interviews

free care when using the worksite clinic (the carrot) but require greater cost-sharing in the form of copays and deductibles when the employee seeks care in the community (the stick).

### Current State of Worksite Care

Though worksite clinics are far from novel for large employers, their popularity continues to grow—as does the ways they are implemented. A 2021 survey found that the prevalence of U.S. employers with 5,000 or more employees offering on-site or near-site primary care clinics has risen 11% over the past decade.[3] While hospitals and health systems are the workplaces most likely to offer these services, on-site care remains popular across industries, including financial services, manufacturing, and retail.

Employers have many options when choosing an operator to run their on-site clinics, and nearly all outsource the business. National worksite providers like Marathon Health and Premise Health develop, staff, and operate a range of clinic models from primary care to occupational health and virtual care. They also offer a high degree of customization and work with employers to assure a return on investment for the employer sponsor.

Marathon Health operates more than 275 health centers across 41 states, while Premise has more than 800 centers serving 11 million employees across the U.S.[4,5] Another leading vendor, Medcor, has been offering on-site and mobile-site care services since 1989 with a custom client portal system for managing records and assessing workplace safety issues.[6]

Employers may also opt for on-site care management through a local or regional health system like OhioHealth. In addition to its 14 hospitals and 200+ ambulatory care sites in 47 counties in Ohio, OhioHealth's Employer Solutions physicians collaborate with employers in "creating a culture of health" through variety of on-site, near-site, and shared-site clinic options for employers with further connectivity to the health system.[7]

### Why Should UC Owners Care About Worksite Clinics?

Competition for urgent care has never been limited to other on-demand healthcare providers. Rather, UC operators must consider *any* option that is available to a prospective patient as a possible competitor. An urgent care might conduct detailed demographic studies before locating a site but might not consider that a percentage of the assumed "serviceable patients" may be getting care for free at work, and thus less likely to access UC.

### Data Transmission

Third-party administrators (TPAs), including health insurance companies, provide employers with aggregated analyses of their plan members' medical utilization and expenditures. After adopting the on-site model, employers want to quantify the return on investment (ROI) of their clinic operations. ROI is a function of total costs to operate the clinic, cost savings vs network utilization, and clinical outcomes. Worksite operators streamline this process by charting medical visits for services performed at the clinic.

However, rather than submitting claims to health insurance like a typical primary care office, the worksite clinic operator submits "dummy claims." The TPA receives the information in a HIPAA-compliant 837 file containing patient claim information—including insurance coding—which allows them to quantify and analyze utilization of the on-site location.

### Payment Models

Another benefit of on-site clinics is the flexibility of choosing a payment model. Depending on the scope of services being offered, employers may have several choices for how to pay, unlike the fee-for-service utilized by most health insurance administrators.

For clinics offering primary care, the per-member per-month structure is common. The employer pays a fixed fee per employee—and possibly per dependent—who utilizes the clinic. Notably, this can introduce an element of risk for the clinic operator since the costs to run the clinic may exceed the monthly stipend received.

Clinics offering occupational medicine services more commonly utilize the cost-plus structure. Here, the employer covers all expenses related to running the clinic as well as an administrative fee, which includes the operator's profit margin.

### Understanding Your Market

On-site care isn't just a consideration for employers utilizing this model. Urgent care operators must also be aware of how widely this model is being used in the community. Ignoring its influence can be a costly error.

Consider this. You estimate 50,000 prospective patients in your community could choose to visit your center for urgent care services. But if 5,000 of them are covered by on-site care through their employer where they can receive free or low-cost treatment, your "serviceable" market may be 10% smaller than your original analysis.

As such, you cannot include this segment of the market in your community analysis. Awareness of this influence is essential for creating accurate projections and targeting your marketing campaigns to the right audience.

### Worksite Clinic Requirements

For urgent care operators seeking to expand into the worksite clinic space, it is important to consider the size of your workforce. **Table 1** provides a rough guide to staffing and capacity for an on-site clinic based on the scope of services being offered, service hours, and the number of employees being served.

Additionally, there are different models, including:

- ***On-site*** serving the employees on one large campus, such as a hospital, call center, or manufacturing plant.
- ***Near-site*** that's not physically on the employer's campus, or that serves employees working in multiple locations. One example is a clinic for school district employees at board of education offices, serving employees working at multiple schools in a district. Another example is a chain supermarket that locates an employee wellness center within a 15- to 20-minute drive of multiple stores.
- ***Shared-site***, in which multiple employers, some of which may have insufficient employee census to operate their own clinic, partner with other employers in operating a near-site clinic. While the clinic might be in a retail location, it is open only to the employees and dependents of the sponsoring employer groups.

### Why Worksite Clinics are Attractive to Employers

On-site care has become popular because of the unique value proposition it affords employers. Offering primary care and occupational medicine through an on-site clinic increases productivity, reduces absenteeism due to illness, and lowers healthcare costs.[1]

Over time, employers spend less thanks to good preventive care. Imagine the difference between paying for the continued care of a premature infant vs paying up front for effective prenatal care. The same goes for diabetes and a host of other conditions. Employers also save on routine health expenditures compared with network insurance. Rather than paying an insurer and the provider, employers pay directly for care—which can be much less. For self-insured employers, the on-site model further rewards employers for keeping their workforce healthy with primary and preventive care.

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### Conclusion

For urgent care operators with extra capacity, exploring the worksite care model can be a worthwhile venture. As employers seek new ways to attract and retain employees with comprehensive benefits packages, the utilization of on-site clinics will continue to increase. Moreover, for urgent care clinics without excess capacity, accounting for the number of on-site clinics in the community is essential for creating an accurate picture of your reachable market. ■

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Case Report

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See CME Quiz Questions on page 13.

# Headache and Paranoid Delusions: A Case Report of Missed Neurocysticercosis

**Urgent Message:** Headaches are common, but when patients present with concurrent psychiatric symptoms, seizures, and signs of increased intracranial pressure, clinical teams might consider asking about recent travel to assess for possible neurocysticercosis infectious etiologies.

Naail Tariq, Cavan Scheetz, and Michael Weinstock, MD

**Citation:** Tariq N, Scheetz C, Weinstock M. Headache and Paranoid Delusions: A Case Report of Missed Neurocysticercosis. *J Urgent Care Med.* 2023;18(1):31-34

## Abstract

### Introduction

Headache is a common urgent care complaint. While most headaches have a benign etiology, it is important for clinicians to consider secondary causes of headache, especially in cases with worrisome associated symptoms.

### Clinical Presentation

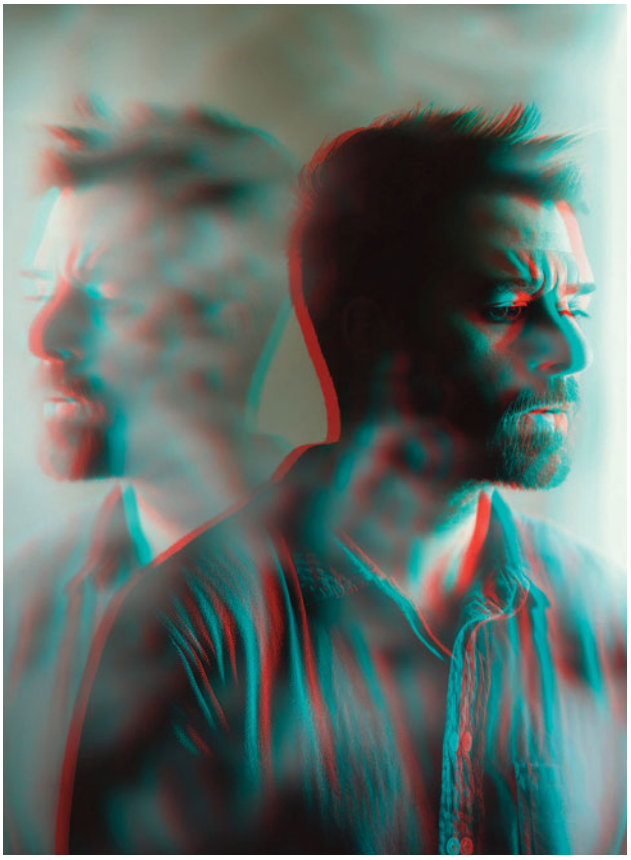
A 32-year-old Hispanic man presented with headache and paranoid delusions that someone was following him.

### Physical and Laboratory Findings

The patient's objective assessment included a normal neurological and general physical exam finding. Initial labs showed only mild leukocytosis.

### Case Resolution

The patient was discharged to follow-up with mental health services, however, he returned to the emergency department via ambulance after experiencing multiple seizures. Additional evaluation with lumbar puncture and head CT revealed findings suggestive of neurocysticercosis. He was subsequently treated with vancomy-



**Author affiliations: Naail Tariq,** student, DeBusk College of Osteopathic Medicine, Lincoln Memorial University. **Cavan Scheetz,** student, Heritage College of Osteopathic Medicine, Ohio University. **Michael Weinstock, MD,** Adena Health System, Wexner Medical Center at The Ohio State University, The Journal of Urgent Care Medicine. The authors have no relevant financial relationships with any commercial interests.

cin and albendazole and his symptoms resolved.

### Conclusion

This case highlights the importance of considering travel history and geographic-specific illnesses and intracranial causes for patients presenting with acute psychiatric symptoms concurrent with somatic symptoms, such as headache, as well as careful review of social history to assess risk of infections or malignancy.

*"Cysticercosis is the most common parasitic disease worldwide, with an estimated prevalence of greater than 50 million infected individuals."*

## Introduction

It is estimated that 50% of the adult population in the world is affected by headaches at some point in life.[1] Headaches account for about 12 million visits in the United States per year.[2] Non-traumatic headaches are responsible for 0.5 to 4.5% of the visits to the emergency department (ED).[3] When assessing a patient for a headache, it is important to differentiate primary headaches, such as tension headaches and migraines, from secondary headaches, such as those from infection or malignancy.[4] When considering the use of neuroimaging and/or lumbar puncture, it is critical to include an evaluation for red-flag symptoms that may indicate a secondary etiology such as fever, neurologic deficits, papilledema, rash, neck stiffness, sudden onset, severity of pain, and impaired consciousness.[2, 4]

While many clinicians assess for focal neurologic changes and systemic signs, apparently psychiatric symptoms may also be manifestations of organic neurologic disease. Such apparently psychiatric symptoms are often varied and nonspecific.[5] It is important for clinicians to have a high index of suspicion for the possibility of neurologic illnesses when assessing the patient with new onset of apparently psychiatric symptoms, especially if there is no history of prior behavioral health disorders.[6]

## Clinical Presentation

A 32-year-old Hispanic man with no past medical history presented to the urgent care center complaining of a headache and paranoid thoughts. He stated that earlier in the week, he developed a throbbing headache in the back of his neck which radiated into his occiput. The day after the headache began, he developed persistent thoughts that someone was following him, and trying to hurt him. He denied any auditory or visual hallucinations but stated that he "felt their presence." He reported he felt compelled to repeatedly look over his shoulder to check if he was being followed. He denied fever, ear pain, sore throat, vision or hearing changes, cough, chest pain, abdominal pain, vomiting, and gastrointestinal or urinary symptoms. He denied having paranoid delusions before and prior psychiatric illness. He admitted to smoking tobacco and occasional cocaine use.

## Physical and Laboratory Exam Findings

The patient's general appearance was normal. He was smiling and laughing and appropriately engaged during the interaction. There were no apparent neurological deficits and his cardiopulmonary and abdominal exams were also unremarkable. He was afebrile and had normal vital signs. A urine drug screen was entirely negative, and a complete blood count was significant only for mild leukocytosis.

## Management

The patient was discharged with a presumptive diagnosis of paranoia and anxiety and was told to follow up with a primary care provider. His headache was treated with a prescription of 600 mg ibuprofen tablets as needed, and he was given education about mental health. Return precautions were provided for worsening symptoms including increasing headaches, changes in vision or hearing, and increased hallucinations or paranoia.

## Differential Diagnosis

A differential diagnosis for presentations with headache and paranoia includes brain masses (particularly involving the frontal or temporal lobes), meningitis, encephalitis, cerebrovascular accident (CVA), stimulant abuse/intoxication, alcohol or other withdrawal syndrome, and psychiatric illnesses including acute psychotic disorder, schizophrenia, bipolar disorder, and depression. This patient denied red-flag symptoms associated with headache, and there were no concerning vitals or physical exam findings.

## Case Continuation and Timeline

The patient presented to the emergency department by ambulance 6 hours after discharge from UC after having multiple seizures. The family who witnessed the

event told the emergency physician that the patient became confused and was unable to walk steadily. He subsequently had a generalized tonic-clonic seizure. On repeat physical exam, the patient was somnolent and minimally responsive. Petechiae were noted on the upper chest, neck, and head.

### Diagnostic Assessment and Case Conclusion

The patient was isolated due to concern for meningitis. A lumbar puncture was performed, which showed moderate leukocytes without organisms and was otherwise unremarkable. A non-contrast computed tomography (CT) scan showed findings consistent with neurocysticercosis. There was an active lesion in the right frontal lobe as well as multiple chronic lesions elsewhere in the brain.

Specialist consult during the hospitalization opined the active lesion in the frontal lobe was the likely cause of the patient's behavioral changes, seizure, and headache. Since the patient had no potential for recent exposure to *T. Solium* and chronic lesions were noted on the CT, the patient's presentation suggested an acute reactivation of chronic neurocysticercosis. The patient was admitted to the hospital and started on albendazole and admitted until he was clinically stable for outpatient follow-up.

### Discussion

Cysticercosis is a preventable parasitic infection caused by the larval stage (enclosed sacs containing the parasite) of the pork tapeworm, *Taenia solium*.[7] Cysticercosis is the most common parasitic disease worldwide, with an estimated prevalence of greater than 50 million infected individuals. It is endemic to Mexico, South and Central America, as well as parts of Africa and Asia.[8] Cysticercosis is acquired through ingestion of undercooked pork from pigs infected with *T. solium*.[9] Symptoms can be diverse and depend on the sites of infection as the parasite may be disseminated in various tissues.

Neurocysticercosis (NCC) occurs when *T. solium* afflicts the central nervous system.[10] It is a leading cause of acquired epilepsy worldwide and has become increasingly prevalent in developed countries due to increased travel and immigration of individuals in endemic regions.[9] NCC is typically diagnosed on neuroimaging (either CT or MRI) and confirmed via serology. Neuroimaging is useful in localizing and determining the stage of the cysts, which affects treatment and prognosis.[11]

If left untreated, NCC's mortality is typically due to complications from cerebral edema, hydrocephalus, and seizures.[11] NCC's mortality is dependent on the location of the cysts.[12] Intraparenchymal cysts are more likely to present with seizures, and are associated with a better prognosis.[12] Extra-parenchymal cysts are more likely to cause hydrocephalus, mass effect, intracranial hypertension, stroke, vasculitis and cranial nerve involvement, and therefore have a higher risk of lethal complications.[13]

*"Neurocysticercosis should be suspected in patients presenting with seizures and signs of increased intracranial pressure, the two most common clinical signs. MRI or non-contrast CT scan will generally reveal typical abnormalities when neurocysticercosis is present."*

Initial management of NCC is typically inpatient and includes antiepileptics, corticosteroids to reduce inflammation, and the antiparasitic agent, albendazole.[12,14] In the United States, the rise of NCC cases can be attributed to an influx of immigrants from endemic regions. While data for the prevalence of NCC in the U.S. is limited, estimates of cases range from 0.2 to 0.6 cases per 100,000 people in the general population, and 1.5 to 1.8 cases per 100,000 Hispanics, for a total estimate of 1,320 – 5,050 new cases of NCC diagnosed in the United States annually.[13] The Centers for Disease Control and Prevention (CDC) considers NCC one of five neglected parasitic infections and has designated it as a priority due for increased monitoring, prevention, and appropriate treatment.[8] It is estimated that up to 2% of ED visits for seizures in the US are related to NCC. However, the entirety of the burden of NCC in the United States is still largely unknown as it is only reportable in Arizona, California, New Mexico, Oregon, and Texas, and under-reporting is believed to be common even in those regions.[9]

### NCC Diagnosis and Management

NCC should be suspected in patients presenting with seizures and signs of increased intracranial pressure

(ICP), the two most common clinical signs. MRI or non-contrast CT scan will generally reveal typical abnormalities when NCC is present. In the absence of risk factors such as increased cranial pressure, suspected neurocysticercosis workup can also include lumbar puncture and CSF evaluation in order to rule out other potential life-threatening infections, especially if imaging is not typical of NCC.[15] The location of neurocysticerci (parenchymal versus extra-parenchymal, intraventricular versus extra-ventricular) and presentation on imaging (calcified versus non calcified, enhancing versus non-enhancing), and the size of the lesions will dictate treatment course moving forward.[14]

Patients should also be screened for latent tuberculosis and *Strongyloides stercoralis* prior to initiation of treatment.[12] Initial treatment for the infection should begin with albendazole for at least 14 days and patients should be monitored for hepatotoxicity and leukopenia.[14] Additional therapy with praziquantel can be added for stronger coverage.[14] The household contacts should also be screened for tapeworm carriage.[14]

NCC presenting with psychiatric symptoms is unusual. A literature review found various case reports reporting similar instances of psychotic symptoms with eventual diagnosis of NCC. A case series found 21 other similar presentations among patients from India, Brazil, Portugal, Nepal and Africa.[16] However, a literature review did not reveal any similar cases originating from patients in the United States.

## Key Takeaways for Urgent Care Providers

- Consider organic causes of psychiatric symptoms in patients with concurrent somatic symptoms and/or no prior history of behavioral health diagnoses.
- NCC should be included in the differential diagnosis for patients with acute psychiatric and/or neurologic complaints, especially if they have a history travel or residence in endemic regions, such as Central and South America.
- NCC is considered a neglected parasitic disease by the CDC and further attention should be given to its prevention, detection, and treatment. It is estimated that up to 2% of ED visits for seizures in the US are related to NCC.
- Early clinical suspicion of NCC can minimize development of high risk complications and reduce morbidity.

## Ethics Statement

The patient presented in this case was lost to follow-up, and therefore unable to give consent. All patient demographics were anonymized in the interest of patient privacy. ■

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Case Report

# When a Bleeding Hemorrhoid Is a Sign of Something More Sinister

**Urgent Message:** An expanded list of differential diagnoses can help clinicians identify when isolated bleeding is related to a more serious condition, as was the situation with this case of acute lymphoblastic leukemia.

Naushair Hussain, Ahmad Ali, and Michael B. Weinstock, MD

**Citation:** Hussain N, Ali A, Weinstock M. When a Bleeding Hemorrhoid Is a Sign of Something More Sinister. *J of Urgent Care Med.* 2023;18(1):35-37

**Key words:** bleeding, petechial rash, thrombocytopenia, case report

## Abstract

### Introduction

Patients may initially have isolated bleeding, thus leading them to an urgent care setting as their initial site of clinical evaluation. In this case, a life-threatening diagnosis of acute lymphoblastic leukemia (ALL) was made only after the differential was expanded.

### Clinical Presentation

A 29-year-old man presented for treatment of symptoms common in an upper respiratory infection (URI) for a 2-3-day duration. He was secondarily concerned about bleeding hemorrhoids and a rash on his abdomen that had started the prior day.

### Physical Exam

The patient's rectal exam revealed a macerated and friable thrombosed mass at the 9:00 position. A focused skin examination revealed a non-blanching petechial rash on the abdomen consistent with petechial lesions.

### Case Resolution

A complete blood count (CBC) revealed a white blood cell (WBC) count of over 100,000. Further testing at a tertiary center confirmed a diagnosis of acute lymphoblastic leukemia.

### Conclusion

Given the varying presentations, a patient with new-onset abnormal bleeding and petechial rash should undergo testing for hematologic pathologies.

## Introduction

A patient with multiple complaints including rectal bleeding due to hemorrhoids is typically managed in an outpatient setting. Following is a case with complaints of upper respiratory symptoms, headache, and bleeding hemorrhoids; this life-threatening diagnosis of acute lymphoblastic leukemia (ALL) was made only after the differential was expanded.

## Ethics Statement

Patient could not be contacted for follow-up and therefore demographics and some details of the case were changed to protect patient anonymity and confidentiality.

## Clinical Presentation

A 29-year-old man presented with a chief complaint of 2-3 days of upper respiratory infection (URI) symptoms which consisted of ear pain, sore throat, nasal congestion, and a rash. He stated he has had body aches and felt stiffness in his back and neck. He had nasal congestion with mild chest congestion, but no productive cough. He was unsure if he had a fever. He was somewhat concerned about meningitis as he did have a headache and a rash

**Author affiliations: Naushair Hussain**, 4th year medical student, Pikeville Kentucky College of Osteopathic Medicine, Adena Regional Medical Center, Chillicothe, Ohio. **Ahmad Ali**, 4th year medical student, Pikeville Kentucky College of Osteopathic Medicine, Adena Regional Medical Center, Chillicothe, Ohio. **Michael B. Weinstock, MD**, Adena Health System; The Wexner Medical Center at The Ohio State University; Ohio Dominican University; The Journal of Urgent Care Medicine. Authors have no relevant financial relationships with any commercial interests.

on his back, arms, and legs the day before. He denied confusion. He also complained of painful bleeding hemorrhoids, which he had also experienced in the past.

The patient's only known medical history was hypothyroidism for which he took levothyroxine. He had no known allergies.

### Physical Exam

The patient's vital signs were entirely within normal limits, and he was alert, oriented, and in no distress.

- Neck was supple without rigidity.
- Cardiopulmonary exam revealed regular heart rhythm and sounds and clear lungs bilaterally.
- Abdomen was soft and nontender.
- Rectal exam revealed a thrombosed mass consistent with an external hemorrhoid, with some macerated and friable areas superficially at the 9:00 position.

### Evaluation and Medical Decision Making

A summary of this patient's initial presentation would be consistent with an upper respiratory infection with a viral exanthem and an incidental mention of hemorrhoids. Because of the bleeding hemorrhoids, additional questioning explored for other types of bleeding. The patient denied blood in the urine, bruising of the skin and nose bleeds, but curiously mentioned that he lately had been having bleeding of the gums when he brushed his teeth.

Because of the additional information provided in review of symptoms, the treating clinician asked the patient to undress so the rash could be examined. That skin exam revealed a non-blanching rash across the entire abdomen consistent with petechial lesions.

### Differential Diagnosis

Petechiae are non-blanching macular skin lesions. Petechiae are < 2 mm in size, distinguishing them from purpura. The differential diagnosis for a petechial rash includes a wide array of etiologies, many of which are life-threatening.[1] Important distinctions can be made that can narrow down differential, with the initial and most critical question being whether the patient is febrile or not.

For patients with petechial rash and fever, important considerations include both infectious and non-infectious etiologies, such as the following:

- Rocky Mountain spotted fever (*Rickettsia rickettsii*) is a bacterial infection spread by tick bites. Infection will usually be accompanied by headaches and fevers along with the rash.[2]
- Bacterial meningitis (most commonly from *S. pneumoniae)* can cause a petechial rash in severe cases by causing platelet consumption via blood vessel damage, although associated symptoms would also include nuchal rigidity, fevers, and oftentimes altered mental status. *N. meningitis* infection can cause petechiae with or without meningitis, as is the case with meningococcemia.[3]
- Disseminated gonococcal infection can also lead to petechiae, although it will usually be accompanied by other inflammatory signs and symptoms such as migrating arthritis.[4]
- Parasites, such as *Babesia microti*, can cause a petechial rash due to platelet destruction from intracellular multiplication.[5]
- Henoch Schoenlein Purpura (HSP) (IgA vasculitis) can lead to petechiae and accompanying fevers are also common. It will be preceded by a viral illness and will often be accompanied by hematuria.[6]
- Thrombotic thrombocytopenic purpura (TTP), in which a defective coding for the enzyme ADAMTS13 leads to unrestrained propagation of microthrombi.[7] TTP is associated with a classic pentad of symptoms, although patients will commonly present without one or more of these symptoms:[8]
  - Thrombocytopenia
  - Microangiopathic hemolytic anemia
  - Neurologic abnormalities
  - Renal impairment
  - Fever
- Many self-limited viral infections, such as parvovirus B19, rhinovirus, adenovirus, enterovirus, and Epstein-Barr virus (EBV), can cause petechiae (with and without significant thrombocytopenia) via as a consequence of the patient's immune response.[9]

Among patients with petechial rash who present without fever, the differential includes:

- Disseminated intravascular coagulation (DIC) can lead to petechiae via widespread consumption of platelets, typically caused by severe systemic illness or injury. Patient's coagulation studies will often show thrombocytopenia as well as abnormal coagulation studies (eg, prothrombin time (PT) and decreased fibrinogen).[10]
- Autoimmune conditions that can cause vasculitis, such as systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA), can cause petechiae via autoimmune destruction of platelets as well as direct microvascular inflammation.[11]
- Immune thrombocytopenic purpura (ITP) is a diagnosis of exclusion. This can lead to severe thrombocytopenia and petechiae via autoimmune destruction of platelets. Patients will frequently be well appearing otherwise.[11]
- Heparin induced thrombocytopenia (HIT) that oc-

curs due to antibody formation against platelet factor-4 (PF4) after exposure to a heparin product.[12]

- Antiphospholipid syndrome (APLS) is an autoimmune disorder that can lead to a petechial rash. This condition can result in platelet destruction and thrombocytopenia.[13]
- In a younger patient, such as this, with new onset symptoms, ALL as well as other hematologic malignancies should be suspected. ALL typically presents with symptoms of abnormal bleeding, fatigue, and can also present with relapsing fever.[14]

While it is important to consider the above diagnoses in patients with petechiae, it is also worth noting that petechiae are more often benign in otherwise well-appearing, afebrile, ambulatory patients. Localized petechiae and petechiae isolated to above the nipple line, particularly in the face and neck, are generally reassuring patterns and may occur after localized pressure to the skin or Valsalva related to coughing or vomiting in the absence of underlying systemic illness.[15,16]

## Case Resolution

The patient had a CBC drawn that revealed a WBC count of over 100,000. He was evaluated at a tertiary care center and found to have acute lymphoblastic leukemia.

## Discussion

Acute lymphoblastic leukemia is the most common cancer in pediatric populations with approximately 3,000 cases diagnosed annually in the United States. The peak incidence of ALL occurs between the ages of 3 and 5 years with higher rates seen in boys when compared to girls and also in White/Hispanic populations.[17] ALL is also the most frequent cause of death from cancer in patients under the age of 20.

ALL is caused when DNA mutations result in marrow proliferation and production of abnormal lymphocytes. Normal lymphocytes are important for immune function; the immature lymphocytes seen in ALL are unable to ward off infections effectively, resulting in functional immunodeficiency. These abnormal lymphocytes will continue to divide and replace normal cells leading to anemia and thrombocytopenia, which accounts for the myriad associated symptoms such as fatigue, shortness of breath, easy bruising, and bleeding seen in patients with ALL.[4] The diagnostic work-up for ALL includes a CBC, bone marrow aspirate, cytogenetic analysis, and/or immunophenotyping.[4] With current therapies for ALL, including chemotherapy, immunotherapy, and bone marrow transplantation, there is now a 90% overall survival rate for those less than 21 years of age.[17]

## Conclusion

- Causes of petechiae are wide-ranging, and most well-appearing patients have no serious underlying diagnosis, especially if petechiae are localized and involve only the face and/or neck.
- Presence of fever, general appearance, associated symptoms, and distribution of rash can help to narrow the differential. Ill appearing patients should be referred immediately to an emergency department.
- A CBC has excellent utility in the initial screening work-up of patients with petechiae.
- Clinical manifestations of ALL can be vague and nonspecific, and patients may not have constitutional symptoms. ■

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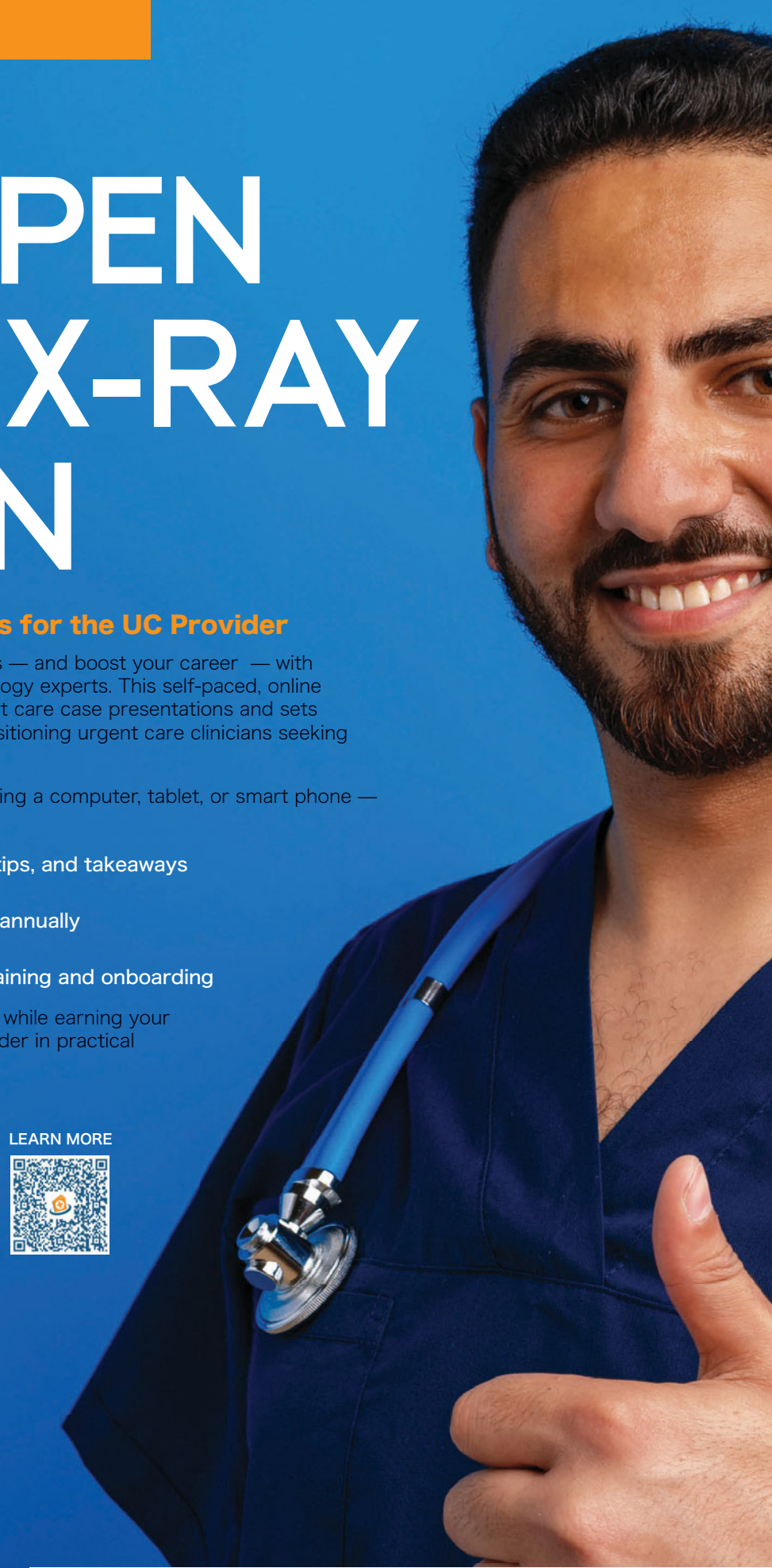
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INSIGHTS IN IMAGES

# CLINICAL CHALLENGE: CASE 1

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 e-mail the relevant materials and presenting information to editor@jucm.com.

## 4 Year Old With Right-Sided Pelvic Pain

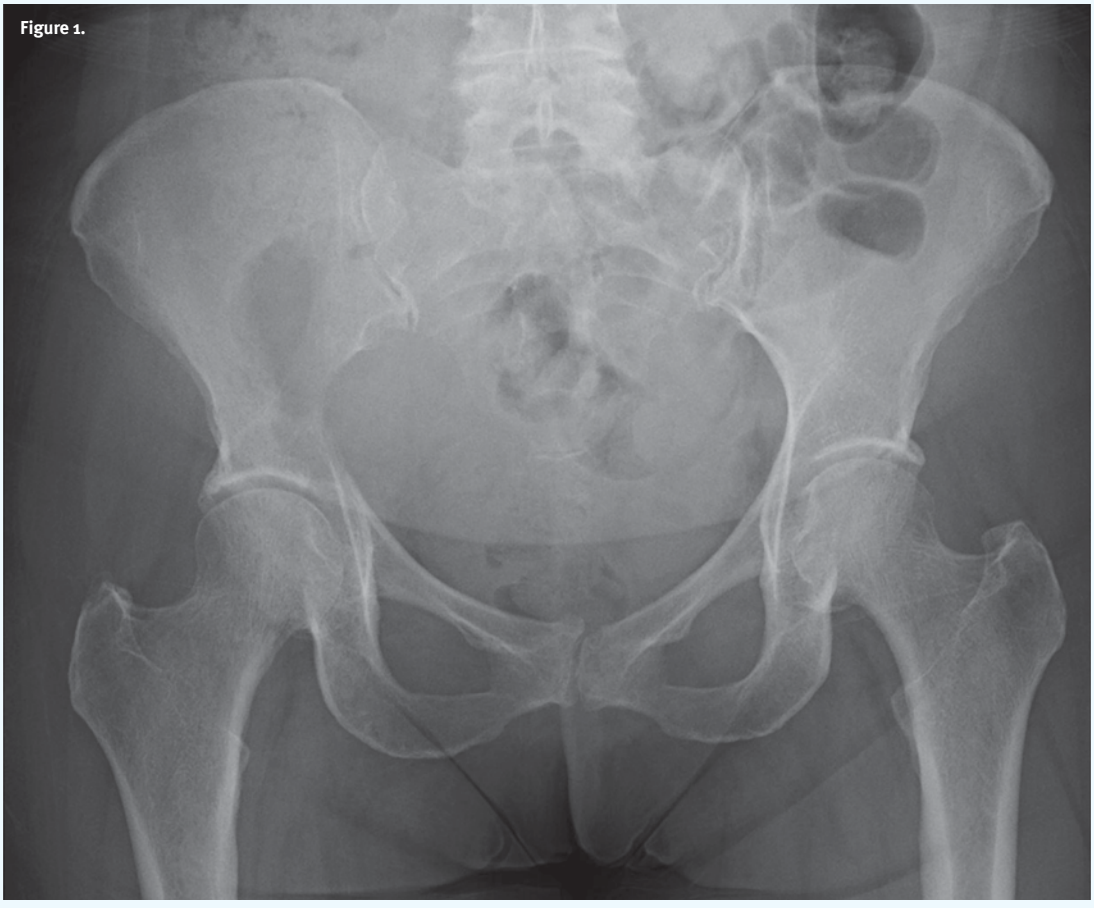
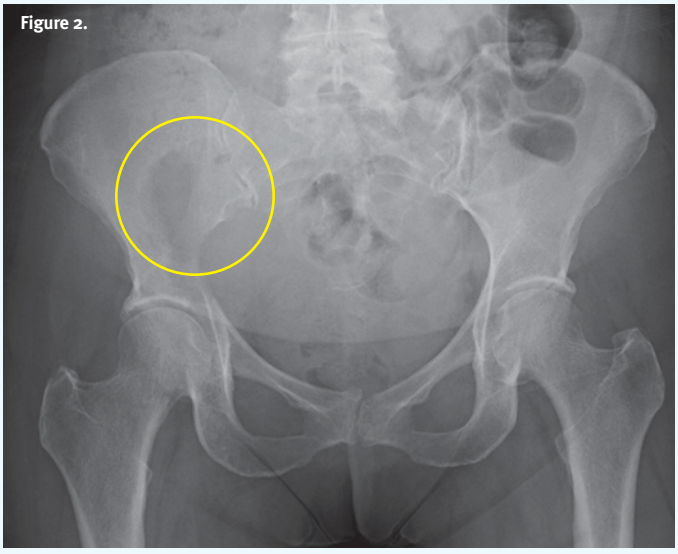


**Figure 1.**

On a Friday afternoon, a worried mother brings her 4-year-old daughter to the urgent care. She says the girl is complaining that her "side hurts." The mother can't recall any recent falls or injuries.

Review the image of the anterior to posterior (AP) pelvis taken upon presentation and consider possible diagnoses and next steps you would recommend to the family.


Figure 2.

**Differential Diagnosis**

- Benign:
  - Most occur before the age of 40
  - Osteochondroma
  - Osteoblastoma
  - Giant cell tumor
  - Fibrous dysplasia
  - Aneurysmal bone cyst
  - Chondroblastoma
- Malignant:
  - Osteosarcoma
  - Chondrosarcoma
  - Chordoma
  - Ewing's
  - Metastases
  - Plasmacytoma
  - Lymphoma
  - Post-radiation sarcoma
- Malignancy Mimics:
  - Hemophilic pseudo tumor
  - Osteomyelitis
  - Insufficiency fracture
  - Particle disease

**Diagnosis**

The imaging reveals a large lytic lesion on the medial right iliac bone with ill-defined lateral margins (cortical destruction) and likely adjacent soft tissue mass. This either represents an aggressive malignancy (ie Ewings Sarcoma, Osteosarcoma, metastatic disease such as Neuroblastoma) or an aggressive benign lesion (ie Langerhans Cell Histiocytosis (LCH), Osteomyelitis, Osteoblastoma, Aneurysmal Bone Cyst).

**What to Look For**

- Age of the patient (4 years old), and painful lesion
- Appearance of the lesion: Fully lytic lesion with wide zone of transition (ill-defined margins) and loss of medial cortex indicating an aggressive lesion, with likely adjacent soft tissue mass
- Look for additional lesions elsewhere in the body

**Pearls for Urgent Care Management**

- Given the appearance in this case, you would be concerned about adjacent soft tissue mass with bony invasion and/or erosion
- Pediatric orthopedic consultation with a specialist in pediatric bone tumors is recommended
- Advanced imaging (MRI) and biopsy is indicated as directed by the pediatric orthopedic oncologist

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*Acknowledgement: Images and case provided by Experity Teleradiology (www.experityhealth.com/teleradiology).*

# CLINICAL CHALLENGE: CASE 2

# 8 Year Old With Facial Lesions

Figure 1.



An 8-year-old-boy presented to urgent care with his father for evaluation of 3 weeks of painless facial lesions. The patient had a history of atopic dermatitis and denies systemic symptoms. On examination, he appeared well. A cluster of umbilicated papules were seen over his right cheek.

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


Figure 2.

**Differential Diagnosis**
- Folliculitis
- Lobular capillary hemangioma
- Milia
- Molluscum contagiosum (pediatric)

**Diagnosis**

The correct diagnosis for the patient in this case is pediatric molluscum contagiosum.

Molluscum contagiosum is a common viral skin infection of childhood caused by a DNA poxvirus. It is usually transmitted by direct skin-to-skin contact, through fomites, or from autoinoculation. There is an increased incidence in children with underlying atopic dermatitis, swimmers, children who bathe together, those who share towels, and immunosuppressed people. The exact incubation period is unknown but is estimated to be between 2 and 6 weeks. Though self-limited, the infection is often chronic and can range from a few months to 4 years before disappearing.

**What to Look For**
- Typical lesions are 2-5mm firm, dome shaped, skin-colored papules with a shiny surface and central umbilication
- Lesions can appear anywhere on the body except palms and soles, most commonly on the trunk, axilla, antecubital and popliteal fossa
- Lesions may be itchy and may become inflamed

**Pearls For Urgent Care Management**
- For immunocompetent patients, molluscum contagiosum is self-resolving with individual lesions resolving in months, however, overall infection may take up to 5 years to resolve
- Treatment with cryotherapy, curettage, cantharidin, and podophyllotoxin may be considered in severe cases
- Molluscum dermatitis is common (eczematous patches surrounding the lesions) and may be treated with topical corticosteroids (low or medium potency)

*Acknowledgment: Image and case presented by VisualDx (www.VisualDx.com/jucm).*

# CLINICAL CHALLENGE: CASE 3

# 46-Year-Old Male With Severe, Worsening Chest Pain

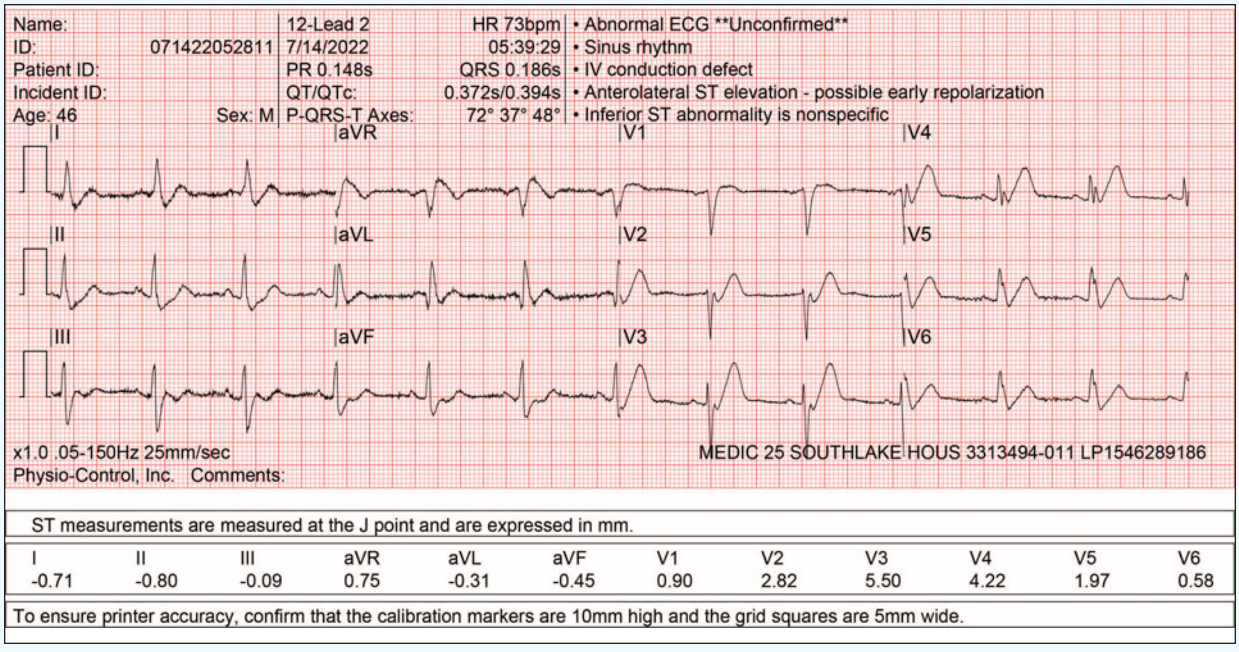



**Figure 1.** Pre-hospital ECG

A 46-year-old man with a history of hypertension presented in an urgent care center saying he's had chest pain for 2 days. He also said the pain has been worsening each day, and today it is severe. He denies nausea, vomiting, or shortness of breath. On exam, he appears uncomfortable but has normal vital signs.

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

Case presented by Catie Reynolds, MD, McGovern Medical School at UTHealth Houston, Department of Emergency Medicine

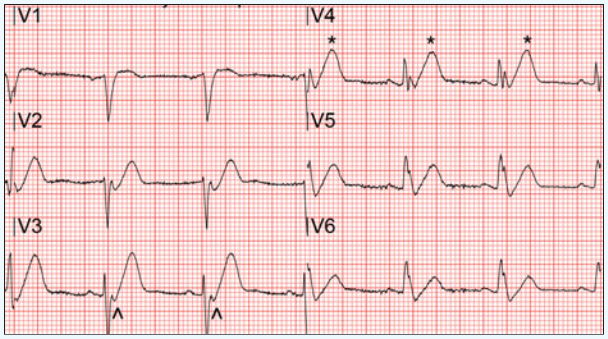



**Figure 2**: (^) indicate upsloping ST depression, (*) indicate large symmetric T waves seen throughout the precordial leads

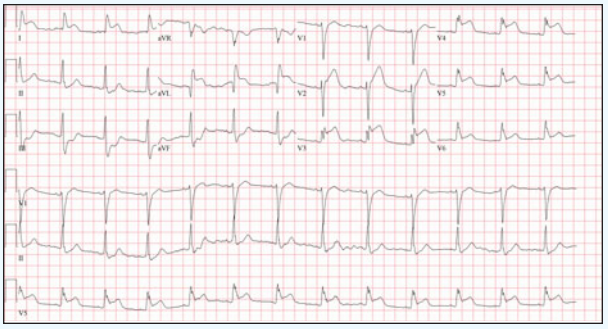


**Figure 3:** Repeat ECG with ST elevation in precordial leads (V2-5) and ST depressions in inferior leads (II, III, aVF). This ECG meets the criteria for a STEMI.

### Differential Diagnosis

- Benign early repolarization
- Hyperkalemia
- de Winter T waves
- ST-elevation Myocardial Infarction (STEMI)
- Brugada syndrome

### Diagnosis

The diagnosis is de Winter T waves. The ECG reveals a normal sinus rhythm and 72 beats per minute. There are tall, symmetrical T waves with upsloping ST depressions in the precordial leads and ST segment elevation in aVR. When compared to the amplitude of the QRS complex, the precordial T waves are large, particularly in leads V4 and V5.

Described in 2008 by de Winter, this pattern of upsloping ST depressions and hyperacute T waves in the precordial leads suggests proximal left anterior descending (LAD) occlusion.[1] While this pattern does not meet classic STEMI criteria, it suggests the presence of an occlusion myocardial infarction that warrants emergent reperfusion. This pattern is seen in just 2% of acute LAD occlusions.[2] Cath lab activation for the de Winter pattern is recommended just as with a classic STEMI pattern.[3]

Characterization of the typical de Winter pattern is:

- 1 to 3 mm upsloping ST depression at the J point in precordial leads
- Large symmetrical T waves in precordial leads
- Narrow or slightly widened QRS complex
- 1 to 2 mm ST-segment elevation in aVR
- Loss of precordial R wave progression in some patients[1]

Large T waves occur in many conditions including hyperkalemia, benign early repolarization, and ischemia. Large T waves found in patients with ischemia are symmetric and broad-based, with an amplitude that is large compared to the size of the QRS complex. Conversely, hyperkalemia causes peaked T waves with a narrow base and a pointed peak. Benign early repolarization is diagnosed with diffuse, concave up ST segment elevation, as opposed to the ST segment depression seen here.

Hyperacute T waves are found in early ischemia and often precede ST segment elevation. De Winter T waves share many similarities with hyperacute T waves, but the de Winter pattern was originally described as static, persisting until reperfusion. The broad, symmetric T waves of the de Winter pattern may persist for hours or days without evolving into an overt STEMI.

### What to Look For

Tall, prominent, symmetrical T waves with upsloping ST depression in the precordial leads should prompt consideration of de Winter T waves. Repeat ECGs in patients with this pattern may remain static or progress to STEMI.

### Pearls for Management; Considerations for Transfer:

- The de Winter pattern is seen in just 2% of acute LAD occlusions and is often under-recognized. While this pattern does not fit classical STEMI criteria, these patients need emergent reperfusion and should be transferred immediately for cath lab activation.
- Recognizing this pattern and expediting transfer will save the life of your patient.

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Case courtesy of ECG Stampede (www.ecgstampede.com).

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# ICD-10-CM: What's New for 2024

Phyllis Dobberstein, CPC, CPMA, CPCO, CEMC, CCC

With the fall season comes all the coding changes for the year. This starts with the 2024 edition of the ICD-10-CM codes, which went into effect on October 1, 2023. As a reminder, there is no grace period. Changes are effective on dates of service as of October 1. Prior to this date, practices should continue to use the 2023 ICD-10-CM code set.

This year, there are 446 changes: 396 new codes, 25 deleted codes, and 13 revisions.

Revisions are important because they involve a change in description versus a change in code number. However, this year, the changes are mainly grammatical and have minimal impact in the urgent care setting.

Deletions usually involve the addition of digits to an existing code to be even more specific. For example, supraventricular tachycardia, code I47.1, now requires a fifth digit:

- I47.10 - Supraventricular tachycardia, unspecified
- I47.11 - Inappropriate sinus tachycardia, so stated
- I47.19 - Other supraventricular tachycardia

A fifth digit was also added to pneumonia due to other Gram-negative bacteria and to acute appendicitis codes:

- J15.61 - Pneumonia due to Acinetobacter baumannii
- J15.69 - Pneumonia due to other Gram-negative bacteria
- K35.200 - Acute appendicitis with generalized peritonitis, without perforation or abscess
- K35.201 - Acute appendicitis with generalized peritonitis, with perforation, without abscess
- K35.209 - Acute appendicitis with generalized peritonitis, without abscess, unspecified as to perforation
- K35.210 - Acute appendicitis with generalized peritonitis, without perforation, with abscess
- K35.211 - Acute appendicitis with generalized peritonitis, with perforation and abscess
- K35.219 - Acute appendicitis with generalized peritonitis, with abscess, unspecified as to perforation

Parkinson's disease will require a fourth and fifth digit to identify if the patient has dyskinesia with or without fluctuations:

- G20.A1 - Parkinson's disease without dyskinesia, without mention of fluctuations
- G20.A2 - Parkinson's disease without dyskinesia, with fluctuations
- G20.B1 - Parkinson's disease with dyskinesia, without mention of fluctuations
- G20.B2 - Parkinson's disease with dyskinesia, with fluctuations
- G20.C - Parkinsonism, unspecified

Codes for a caregiver's non-compliance with a treatment plan added digits to indicate if the reason is due to financial hardship. This would be considered a social determinant of health and may have an impact on the management risk for leveling an evaluation and management visit.

- Z91.A41 - Caregiver's other noncompliance with patient's medication regimen due to financial hardship
- Z91.A48 - Caregiver's other noncompliance with patient's medication regimen for other reason
- Z91.A51 - Caregiver's noncompliance with patient's renal dialysis due to financial hardship
- Z91.A58 - Caregiver's noncompliance with patient's renal dialysis for other reason
- Z91.A91 - Caregiver's noncompliance with patient's other medical treatment and regimen due to financial hardship
- Z91.A98 - Caregiver's noncompliance with patient's other medical treatment and regimen for other reason

In new codes, there are several additions for foreign body sensation: H57.8A1 to H57.8A9 for the eye, R09.A0 to R09.A9 for the throat, nose, and all other sites.

Two codes were added to the list for chronic obstructive pulmonary disease:

- J44.81 - Bronchiolitis obliterans and bronchiolitis obliterans syndrome
- J44.89 - Other specified chronic obstruction pulmonary disease



**Phyllis Dobberstein, CPC, CPMA, CPCO, CEMC, CCC,** is RCM Compliance Manager, Experity

An option was added for hypertension: I1A.0, resistant hypertension.

The complete list of changes can be found on the Centers for Medicare and Medicaid Services' website.

**COVID-19 Guideline Changes**

Instructions for coding for COVID-19 have been updated: "For screening for COVID-19, including preoperative testing, assign code Z11.52, encounter for screening for COVID-19." A screening is when a test is required, yet it is not medically necessary as the patient exhibits no signs of illness.

Asymptomatic individuals with actual or suspected exposure to COVID-19 should be reported with code Z20.822, contact with and (suspected) exposure to COVID-19. This test is not a screening as it is medically necessary. It is important that providers understand the distinction as insurance plans do not have to cover screenings, so this should be considered a cash pay service. Claims for exposure would generally be reimbursed by most insurance plans.

Also, avoid the use of the word "screening" if the reason for the visit does not meet the definition of a screening above. Use of the word "screening" while the patient has been exposed or is even symptomatic may result in a recoupment or denial on payer review.

If the patient is symptomatic and tests negative for COVID-19, be sure to report the symptoms to support medical necessity for the visit.

**Common Diagnosis Coding Denials**

**Laterality:** Laterality specifies whether the condition occurs on the right, the left, or is bilateral. An example is ICD-10 H60.339 (swimmer's ear, unspecified ear).

In some cases, there is no bilateral option. The provider should list the ICD-10 twice: one code for the right and one code for the left. Many of the Blue Cross insurance products adopted a new policy effective August 1, 2023, whereby they will deny claims that do not specify laterality.

**Signs and Symptoms:** Generally, if there is a definitive diagnosis, the patient's symptoms do not have to be reported on the claim. This is correct coding according to the guidelines. However, the exception to this rule is diagnostic testing, especially laboratory testing. For these services, most payers require the symptoms for payment. This is done to ensure the test was medically necessary, regardless of the results. ■





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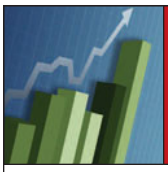
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## DEVELOPING DATA

# Center Locations Double, Driven by Big Consumer Trends

Across the hills and valleys of healthcare, the rising power of the consumer has reshaped the landscape more than any other market shift in recent memory. Patient preferences are fueling demand for everything from virtual care to retail-store clinics. For urgent care, the innovations represent thrilling opportunity alongside equal measures of competition. The ratio of wins to losses will vary by market.

Yet even with the large-scale disruption, urgent care has grown with intention, both in terms of rooftops and in terms of services. The current growth rate is 7%, according to new deep-dive data from the Urgent Care Association (UCA). In its industry white paper, UCA notes that consumer behavior is a significant driver of center growth.

Comparing center numbers in 2014 to today, you'll see a 100% increase in rooftops. That means consumer access to urgent care locations has doubled in just a decade, representing an estimated 200 million patient visits per year. It's doubtful any other healthcare segment with scale can claim a similar growth trend.

Another ubiquitous trend that translates well in the urgent care space is the fact that all healthcare is local. Although the pandemic era temporarily altered the delivery of certain types of care—and some permanent changes remain—patients and clinicians have largely returned to in-person settings. UCA data likewise reveals that more than 78% of Americans live within a 10-minute drive of an urgent care center.

Texas, California, New York, Florida, and North Carolina rank as the top five states for growth. It seems obvious that the most populous states would have the most centers, but it's more than just the number of consumers in the market. Payer mix, rural health needs, and demographic trends also figure in. ■

### URGENT CARE CENTER GROWTH 2014-2023




Data source: Urgent Care Association. Urgent Care Industry White Paper, The Essential Nature Of Urgent Care In The Healthcare Ecosystem Post-Covid-19. August 2023. https://bit.ly/3rg11uz. Accessed September 13, 2023.

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