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Acute Compartment Syndrome: A High-Stakes, Time-Sensitive Diagnosis

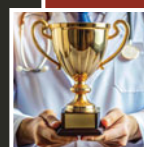


ALSO IN THIS ISSUE

- 21 Research**
HIV Screening in a Real-World Urgent Care Setting
- 25 Case Report**
Risks of Anchoring Bias in Repeat Visits for Dyspnea
- 31 Clinical Topic Review**
HSV Serology: A Commonly Requested Test With Potentially Significant Consequences

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39 Practice Management
The 2025 Urgent Care
Top 100

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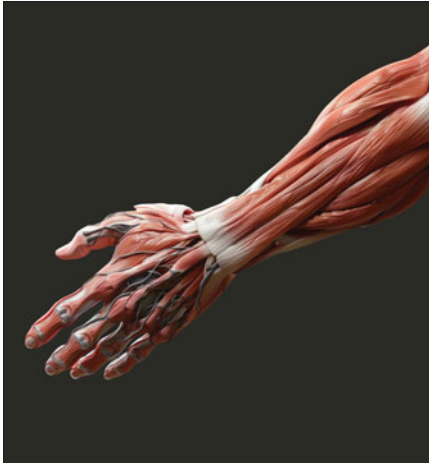
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ORTHO CASE SERIES

15 Legal Considerations and Urgent Care Management of Acute Compartment Syndrome

Compartment syndrome is a limb-threatening emergency that can present with variable clinical signs and symptoms. When the diagnosis is missed or delayed, poor functional outcomes and subsequent malpractice claims are common. Prevention of negative outcomes relies on early detection and a low-threshold to refer patients to the emergency department when there is clinical suspicion.

Josie L. Bunstine, DO; Ariel Cohen, DO

ORIGINAL RESEARCH

21 Brief Report: PrEPare for Action—A Quality Improvement Project for Expanding HIV Screening in the Urgent Care Setting During the COVID-19 Pandemic



A quality improvement program demonstrated the successful integration of HIV services into urgent care, achieving a higher consent rate than traditional settings.

Erin Hunt, PA; Megan Greger, PA; Neal Shipley MD, MBA, FACEP

CLINICAL TOPIC REVIEW

31 Herpes Simplex Virus Infections: An Overview of Testing for the Urgent Care Clinician



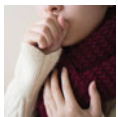
Polymerase chain reaction testing is recommended for patients with lesions that could represent herpes simplex virus infection. It is

imperative that urgent care clinicians understand the utility and characteristics of such testing as well as the implications of findings.

Brittney Tice, FNP, DNP; Joseph Something, PA; Benjamin Zimmerman, PhD

CASE REPORT

25 Dyspnea in an Asthmatic Patient Following an Influenza Infection: A Case Report



While patients with asthma will frequently experience exacerbations following viral respiratory infections, the urgent care clinician must be cautious when assuming dyspnea is due to asthma. As dyspnea can be caused by a wide variety of conditions, it is important to maintain a broad differential diagnoses, even in patients with underlying asthma.

Tracey Quail Davidoff, MD, FCUCM

PRACTICE MANAGEMENT

39 The 2025 Urgent Care Top 100



This exclusive JUCM analysis identifies the 100 largest urgent care operators by number of locations. Of the nation's 14,442 urgent care centers, 40% are operated by a Top 100 entity.

Alan A. Ayers, MBA, MAcc

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DEPARTMENTS

- 3 Urgent Care Perspectives
- 7 Urgent Interactions
- 9 From the UCA CEO
- 10 Continuing Medical Education
- 43 Abstracts in Urgent Care
- 49 Insights in Images
- 59 Revenue Cycle Management
- 61 Developing Data

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UCA





Embracing AI in Medicine: The Role of Large Language Models in Healthcare

■ Ethan Szpara, DO

Consider the case of a pediatric patient who presents with recurrent sore throat, erythema, no tonsillar exudates, and a negative viral panel. The patient has a positive group A strep (GAS) PCR swab, however, was recently diagnosed with streptococcal pharyngitis a couple weeks ago and just finished a course of amoxicillin 7 days ago. Is this a false positive PCR test result? What is the next appropriate course of action? What is the overall incidence of failed outpatient therapy of GAS versus recurrence? Is repeat treatment indicated, and what would be the most appropriate second-line therapy based on current evidence and guidelines?

Primary care, emergency medicine, and urgent care clinicians might easily encounter a case like this on their next shift. Even though the elements of this case are routine, it is likely many clinicians would have some uncertainty about what the current evidence and relevant guidelines might suggest is the best course of action. Most clinicians, in such instances, will reach for search tools such as PubMed or UpToDate, however, finding an answer to such a specific question can prove challenging and time-consuming. Knowing this, some may choose instead to curbside a colleague or supervising doctor. But is this best practice?

Artificial intelligence (AI) search tools are permeating clinical medicine. A subset of clinicians has already adopted AI tools as their preferred method of referencing answers to these unique clinical questions. However, is this practice ready for prime time? With so many AI software platforms bursting onto the AI scene, how can clinicians know which ones are trustworthy?

AI has rapidly integrated into many aspects of clinical

medicine over recent years.¹ Large language models (LLMs) currently serve as key “engines” powering various AI tools that help answer clinical questions. Widely used examples of LLMs include ChatGPT, Claude, Gemini, and Perplexity. While versatile, these general-use tools may lack reliability in specialized medical contexts. As AI and LLMs are increasingly used by clinicians for diagnostic support, guaranteeing reliability and explainability of AI outputs are critical to ensure AI will deliver on the promise of improving efficiency without adversely affecting patient care or safety.^{2,3}

A Brief History of AI in Healthcare and LLMs

Various forms of AI have been implemented in healthcare conceptually for over half a century with the idea of “machine learning” first emerging in the 1950s. In the 1970s, an AI program called MYCIN, created at Stanford University, was first used to help physicians by suggesting when and which antibiotics to use for certain infections.⁴ Early AI was largely rules-based, and due to limited computing power and insufficient available data, the extent to which machine learning could occur was limited. Beginning in the 2000s, the leap in computational power and digitized medical data began allowing for AI systems to develop into much more versatile and powerful tools, which began showing promise in areas such as medical imaging, predictive analytics, and diagnostics.⁵ More recently, LLMs have become widely available and affordable. This evolution has prompted accelerated adoption among clinicians seeking tools to alleviate the cognitive and administrative burdens of clinical practice.

Introduction to LLMs: How Do They Work?

LLMs can be thought of as “digital brains,” which have developed their unique form of understanding through the process of data training. The models are trained on vast datasets so that they might identify patterns and make probabilistic predictions. When queried, LLMs



Ethan Szpara, DO, cares for patients at Illinois Emergency Medicine Specialists, serving several Emergency Departments in the Chicagoland area, and is a clinical instructor for the University of Illinois at Chicago Emergency Medicine Program at Little Company of Mary Medical Center.

generate a response based on the patterns they have been trained to identify. In other words, they are not truly “thinking” in a fully human sense. However, like human intelligence, LLMs use prior experience (ie, data training) to detect patterns and, when identified, predict the most likely outcome.

“Designing LLMs with this specific functionality allows for not only fast, reliable answers to clinical conundrums, but also the opportunity for clinicians to learn about the existence of newer evidence and guidelines.”

LLMs engage in natural language processing (NLP) specifically to achieve this. NLP can be subdivided into 2 components: natural language understanding (NLU) and natural language generation (NLG). NLU refers to a model’s ability to interpret written human language. It allows AI to extract meaning from text, and based on the context, it can then understand questions being asked by a human user. Alternatively, NLG is the process by which models generate written text that conforms to accepted grammatical and syntax rules and is expected to be meaningful to a human reader. LLMs utilize both NLU and NLG elements, and these processes often occur simultaneously.

LLMs develop their expertise by virtue of data training, which involves exposure to vast datasets of text such as books, scientific articles, and websites. The training data used by LLM developers is a critical decision in shaping the models’ potential outputs. Like other types of AI, LLMs rely on the concept of neural networks. Neural networks involve layers of mathematical functions called nodes, which process data through their integrated function. The network can predict patterns with higher accuracy by training on larger amounts of diverse data. As you descend through the layers of the network, each layer and node completes various complex tasks, such as recognizing a piece of a pattern. Each layer of the network builds on that pattern as the network progresses through the layers and learns the data. Ultimately, at the last layer of the network, an output emerges based in probabilistic predictions from the learned patterns that appear to “understand” the information being processed. While LLMs do not understand in a human

sense, they can approximate understanding by modeling human language statistically.

Application of LLMs in Modern Medical Practice

While younger individuals historically have been the early adopters of new technologies,⁶ clinicians of all specialties and ages are showing interest in the potential applications for AI in various domains of patient care.⁷ In 2022, the release of GPT-3.5 and then ChatGPT provided a first glimpse into the vast potential applications of LLMs in clinical practice. This first wave of broadly applicable LLMs, for all their promise, suffered from excessive tendency to exhibit bias and “hallucinate” by fabricating responses in attempt to answer user queries without substantive evidential support.⁸ Subsequently, additional AI platforms, such as Claude AI, sought to provide more reliable and bias-free output. Perplexity, another AI platform, was designed to improve explainability by offering citations to statements made in its output. However, this explainability does not necessarily confer reliability as references may include non-peer reviewed publications, such as personal blogs or promotional websites. While the potential for specialized LLMs, particularly in medicine, has been apparent, sophisticated users readily recognize the significant dangers that exist with unreliable and/or biased output.

To address this, our team at OpenEvidence, has developed an AI platform designed for practicing clinicians. The model has been specifically engineered to imitate the more nuanced decision-making process a clinician would follow—much like when choosing primary data or literature to support a clinical decision.

OpenEvidence allows providers to ask clinical questions and receive responses sourced from peer-reviewed literature as well as clinical guidelines, and it provides supporting citations so that clinicians can verify their veracity. This functionality can improve efficiency and promote cognitive off-loading.

As an example, let’s take the GAS case introduced above. In less than a minute, the model can address all of the questions raised regarding our pediatric patient with sore throat. Specifically, the model generates the response that treatment failure rates can be seen in approximately 10-20% of GAS cases treated with amoxicillin.⁹ It also states that recurrent positive results can be due to residual DNA material, chronic carriage, or true symptomatic recurrence.¹⁰ Combing the individual articles with traditional reading or search functions would take much longer to find the same information. Designing LLMs with this specific functionality allows for

not only fast, reliable answers to clinical conundrums, but also the opportunity for clinicians to learn about the existence of newer evidence and guidelines.

Challenges and Ethical Considerations

Integrating AI, especially LLMs, into clinical practice cannot be pursued without careful consideration for the ethical implications of its use. Understanding that hallucinations can occur and how they can be identified and mitigated is central to the safe clinical application of LLMs. Hallucinations are fabricated outputs and unsubstantiated answers to user questions. They occur for various reasons, but without intentionality in training and LLM design, they can prove difficult to detect and prevent.⁸ It is imperative that clinicians are aware of the theoretical risk of hallucinations when choosing to use an LLM to assist in clinical decision making.

Bias is another challenge that AI systems face. If a system is trained on the entire internet, it is important to note that this could include sources that are not factually accurate. Bias exists in all forms of text, and LLMs can incorporate this bias through the process of machine learning, replicating it in their output. In healthcare systems, similar bias can occur if AI is trained on data sets that reflect existing biases of clinicians. For example, if an LLM is trained on data in which an already marginalized group has pain inadequately treated, the model may recommend a suboptimal pain management approach to similar patients, thereby perpetuating existing biases.¹¹

There are several ways in which LLM developers may mitigate the risks of bias and hallucinations infiltrating outputs. These areas are subjects of intensive ongoing study and have led to an increased understanding of the importance of data quality and human feedback.^{8,12} Fine tuning of models based on high quality expert curated data sets is an important component for the delivery of accurate output from LLMs.

The Future of LLMs in Medicine

The future of LLMs in medicine is promising, but their promise being realized will require vigilance from both those who design the tools and the end users (ie, clinicians). Given the rapid developments in AI, it is imperative that users remain aware of limitations when incorporating LLM output into clinical practice. “Trust but verify,” is a mantra that has been used to guide the supervision of generations of medical trainees and is an apt mantra for LLM use by clinicians. I have devoted my time and effort to help the developers and engineers at OpenEvidence improve the platform because I believe in

“Given the rapid developments in AI, it is imperative that users remain aware of limitations when incorporating LLM output into clinical practice.”

the value this product can provide for a busy clinician seeking to practice evidence-based care. However, with growing adoption and acceptance of LLM use, it is critical to remember that it is incumbent on all of us, the human clinicians making medical decisions for our patients, to exercise good judgment and critical thinking before implementing LLM outputs. LLMs are powerful tools, but it is important to remember that we, the clinicians, are the ones from whom the patient receives care. ■

References

1. AIPRM. AI in Healthcare Statistics. AIPRM; 2024. Accessed April 2, 2025. <https://www.aiprm.com/ai-in-healthcare-statistics/>
2. Elhaddad M, Hamam S. AI-Driven Clinical Decision Support Systems: An Ongoing Pursuit of Potential. *Cureus*. 2024;16(4):e57728. doi:10.7759/cureus.57728
3. Scispot. AI Diagnostics: Revolutionizing Medical Diagnosis in 2025. Scispot. Published March 20, 2024. Accessed April 1, 2025. <https://www.scispot.com/blog/ai-diagnostics-revolutionizing-medical-diagnosis-in-2025>
4. Press G. 12 AI Milestones: 4. MYCIN—An Expert System For Infectious Disease Therapy. *Forbes*. April 27, 2020. Accessed April 2, 2025. <https://www.forbes.com/sites/gilpress/2020/04/27/12-ai-milestones-4-mycin-an-expert-system-for-infectious-disease-therapy/>
5. Keragon Team. When Was AI First Used in Healthcare? The History of AI in Healthcare. *Keragon*. Published February 29, 2024. Accessed April 2, 2025. <https://www.keragon.com/blog/history-of-ai-in-healthcare>
6. Randstad. Generational Divide: AI Adoption. Randstad USA. Accessed April 2, 2025. <https://www.randstadusa.com/business/business-insights/workplace-trends/generational-divide-ai-adoption/>
7. American Medical Association. 2 in 3 physicians are using health AI: 78% jump in one year. AMA. Published April 1, 2024. Accessed April 2, 2025. <https://www.ama-assn.org/practice-management/digital/2-3-physicians-are-using-health-ai-78-2023>
8. Farquhar S, Kossen J, Kuhn L, et al. Detecting hallucinations in large language models using semantic entropy. *Nature*. 2024;630:625-630. doi:10.1038/s41586-024-07421-0
9. Gerber MA, Baltimore RS, Eaton CB, Gewitz M, Rowley AH, Shulman ST, Taubert KA. Prevention of rheumatic fever and diagnosis and treatment of acute streptococcal pharyngitis: A scientific statement from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee of the Council on Cardiovascular Disease in the Young, the Interdisciplinary Council on Functional Genomics and Translational Biology, and the Interdisciplinary Council on Quality of Care and Outcomes Research: Endorsed by the American Academy of Pediatrics. *Circulation*. 2009;119(11):1541-1551. doi:10.1161/CIRCULATIONAHA.109.191959
10. Randel A, Infectious Disease Society of America. IDSA updates guideline for managing group A streptococcal pharyngitis. *Am Fam Physician*. 2013;88(5):338-340.
11. Obermeyer Z, Powers B, Vogeli C, Mullainathan S. Dissecting racial bias in an algorithm used to manage the health of populations. *Science*. 2019;366(6464):447-453. doi:10.1126/science.aax2342
12. Mittermaier M, Raza MM, Kvedar JC. Bias in AI-based models for medical applications: challenges and mitigation strategies. *NPJ Digit Med*. 2023;6:113. doi:10.1038/s41746-023-00858-z

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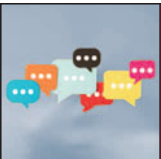
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URGENT INTERACTIONS



“Have a differential diagnosis for every patient.”

— **Joshua W. Russell, MD, MSc, ELS, FCUCM, FACEP**
JUCM Editor in Chief



“If we work a full career over about 30 to 40 years, we’ll see 150,000 to 200,000 patients. Even being 99.9% right, we will miss 150 to 200 diagnoses. If we don’t get a good history and exam and provide good discharge instructions with a consideration of diagnostic uncertainty, we are just hoping to get lucky!”

— **Michael Weinstock, MD**
JUCM Senior Clinical Editor



“Compartment syndrome is an orthopedic emergency that can present with variable clinical signs and symptoms. When the diagnosis is missed or delayed, poor functional outcomes and subsequent malpractice claims can result. Urgent care clinicians can play an important role in early detection and referral to the emergency department to prevent negative outcomes.”

— **Josie L Bunstine, DO**, author of Legal Considerations and Urgent Care Management of Acute Compartment Syndrome in the Upper Extremity (page 15)



A WORD OF THANKS

The Journal of Urgent Care Medicine would like to thank the dedicated group of urgent care professionals listed below who graciously contributed their time and insight to review recent articles for publication. The peer reviewer status is worthy of inclusion on your curriculum vitae, so if you’re interested in becoming a peer reviewer, reach out to the JUCM team at: editor@jucm.com.

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Optimism

■ Lou Ellen Horwitz, MA

The annual Urgent Care Convention is always my prime time for taking the pulse of the field. I hope you were among those able to join us in Dallas last month! There's just no substitute for in-person conversations and observations.

What I expected to hear is not what I heard. There are a lot of reasons to be pessimistic right now; some of them are new and some are the same challenges we've been working through for some time. Reimbursement remains pretty stagnant, staffing is still a challenge, visits have been flat in some parts of the country, supply costs continue to rise, and there's uncertainty in the markets. All of this should have added up to a dismal mood among both participants and exhibitors, but that's the opposite of what we experienced.

The mood of the crowd in Dallas was absolutely magnetic. People were excited to talk to each other, there was plenty of laughter, class sessions were standing room only, and the dance floor at the Foundation Celebration was thumping as usual! I've written many times about the resilience of Urgent Care people and our creativity in solving problems. Even with all of the headwinds, we seem to be "Driving Change" as much as ever.

What that change looks like, however, continues to evolve across the field. Some folks are doubling down on acuity, others are doubling down on door-to-door time (hard to do both), some are focusing on downstream impacts, and some are amping up ancillary services. One thing we've all learned during this evolution: Success requires an "all-in" approach.

You can't ultimately be successful by just dipping your toe into any of these approaches. They compete with each other through workflows, hiring and training strategies, equipment investments, contract negotiations, and external relationships. Picking an approach and betting on it fully is the name of the game right now. The good news is

that from what I heard at the Convention, any and all of these approaches can be successful if done well.

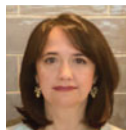
Urgent Care is resilient and creative. While many others have gone all-in on assorted on-demand or patient-centric opportunities, they aren't doing it with the longitudinal expertise all of you have in the on-demand healthcare space. You make it look easier than it actually is, which leads to a lot of hubris on the part of new entrants. It's no wonder they are struggling to disrupt us.

On the advocacy front, things are moving well. We've had good meetings with the new leaders at Centers for Medicare and Medicaid Services and are guardedly optimistic about getting something into the 2026 Medicare Physician Fee Schedule (MPFS) that's positive for Urgent Care. With anticipated annual changes to the MPFS and the timing of brand new political appointees potentially resetting the priorities, it will be a small miracle if we can get our wish, but we remain hopeful. We will know this summer. If we miss the window for 2026, we have a plan, but we'd much prefer to get a quick victory and move on to commercial payer advocacy!

Summer is typically a quieter time in Urgent Care, which makes it the perfect time for staff hiring, training, and re-training to gear up for fall. For that, we have a new gift for you that is *absolutely free* until next summer.

Thanks to an ongoing grant from the Centers for Disease Control and Prevention to the Urgent Care Foundation, we are pleased to provide a brand new podcast on antibiotic stewardship that offers unique perspectives on this familiar topic. We've partnered with Hippo Education, which is widely known for their fun podcasts, to put together a program expressly for Urgent Care that focuses more on how to interact with patients (and their parents) regarding appropriate antibiotic use so that you can get over the humps that stand in the way of implementing the medicine that you know is best.

It's 5 hours of content and is available *for free* for a limited time. You can learn about it on the UCA website (urgentcareassociation.org) or on the Hippo Education website (hippoed.com) and get free access for yourself or your clinicians by contacting Hippo. We are really excited about how this will make your job easier! ■



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



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Expiration Date: May 31, 2027

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Legal Considerations and Urgent Care Management of Acute Compartment Syndrome in the Upper Extremity (page 15)

1. Increased pressure related to compartment syndrome can cause which of the following?

- a. Collapse of vascular structures
- b. Impaired perfusion to local tissues
- c. Tissue ischemia and necrosis
- d. All of the above

2. Which of these is *not* a classic clinical hallmark associated with compartment syndrome (the “6 Ps”)?

- a. Pulselessness
- b. Poikilothermia
- c. Polyuria
- d. Pain out of proportion to the injury

3. What recommendations should an urgent care clinician provide to a patient with suspected compartment syndrome?

- a. Alternate heat and ice on affected area
- b. Take non-steroidal anti-inflammatory drugs for 3-4 days
- c. Use a splint for 3-4 weeks
- d. Refer to emergency department care immediately

Dyspnea in an Asthmatic Patient Following an Influenza Infection: A Case Report (page 25)

1. Which patients may be at increased risk for serious complications related to influenza?

- a. Those with comorbidities such as asthma
- b. Young children and infants
- c. Elderly adults
- d. All of the above

2. What is diagnosis momentum?

- a. When clinicians assume a previous diagnosis is responsible for the current symptoms
- b. When clinicians disregard a previous diagnosis
- c. When clinicians create a list of differential diagnoses
- d. When clinicians order more diagnostic testing than is necessary

3. What percentage of cases of myocarditis are due to viral infections?

- a. 20-30%
- b. 30-50%
- c. 50-70%
- d. 80-90%

Herpes Simplex Virus Infections: An Overview of Testing for the Urgent Care Clinician (page 31)

1. What is the incubation period of HSV-1 and HSV-2?

- a. 24 hours
- b. 4-7 days
- c. 10-14 days
- d. 30 or more days

2. What type of testing is recommended in patients with genital or orolabial lesions that could represent HSV infection?

- a. Polymerase chain reaction (PCR)
- b. Point of care ultrasound
- c. Blood antibody
- d. Skin prick

3. What type of testing works by detecting HSV glycoproteins or HSV-specific antibodies?

- a. Serology testing
- b. Enzyme-linked immunosorbent assay (ELISA)
- c. Western blot
- d. All of the above

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Legal Considerations and Urgent Care Management of Acute Compartment Syndrome in the Upper Extremity

Urgent Message: Compartment syndrome is a limb-threatening emergency that can present with variable clinical signs and symptoms. When the diagnosis is missed or delayed, poor functional outcomes and subsequent malpractice claims are common. Prevention of negative outcomes relies on early detection and a low-threshold for emergency department referrals.

Josie L. Bunstine, DO; Ariel Cohen, DO

Citation: Bunstine JL, Cohen A. Legal Considerations and Urgent Care Management of Acute Compartment Syndrome in the Upper Extremity. *J Urgent Care Med.* 2025; 19(9):15-20

Key words: Compartment Syndrome, Medical Malpractice

Abstract

Acute compartment syndrome is a limb-threatening emergency that can present with variable clinical signs and symptoms in the urgent care (UC) setting. It is important for UC clinicians to recognize injuries that predispose to compartment syndrome as well as concerning, early findings suggestive of the diagnosis. This will allow for expeditious referral to an emergency department (ED) where fasciotomy may be performed. Clinicians can improve patient outcomes and limit their exposure to medical malpractice claims by adopting a liberal referral practice for UC patients with suspected compartment syndrome.

Clinical Scenario

A young man presented to an ED after his left arm was crushed between 2 forklifts at work. On physical exam, he was found to have left arm swelling and

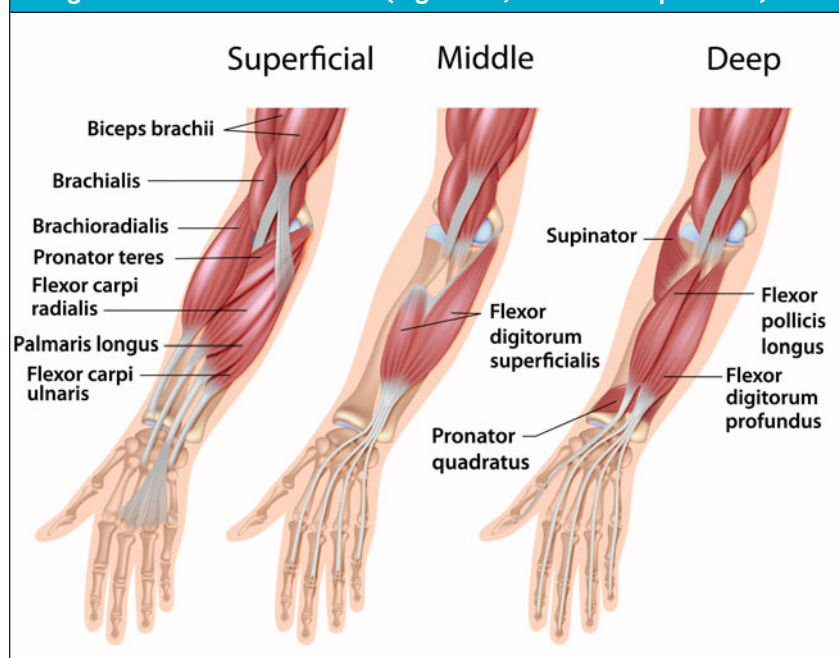
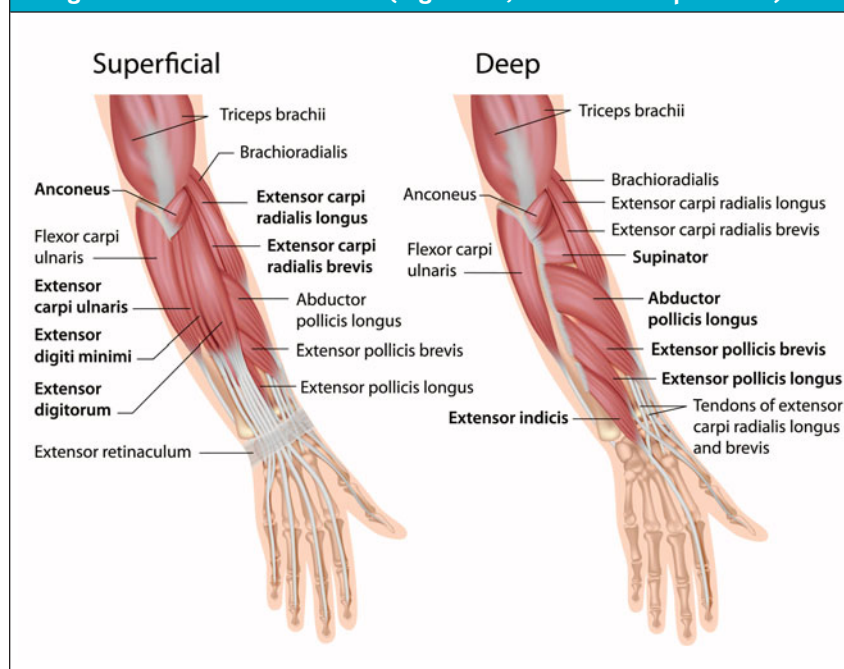
Questions for the Clinician at the Bedside

1. When should acute compartment syndrome be suspected?
2. What should be done in the urgent care setting in the case of suspected acute compartment syndrome?
3. Does time to surgical intervention impact functional outcomes in patients with acute compartment syndrome?
4. How can clinicians avoid medical malpractice situations in cases of acute compartment syndrome?

tenderness of the proximal forearm. He was neurovascularly intact with sensation, motor function, and capillary refill all documented as "good." X-ray (XR) imaging of the left forearm showed no fractures.

The patient was subsequently discharged home with his left arm in a splint. The aftercare instructions did direct the patient to return to the ED or contact orthopedics if there was new or worsening paleness or a purple color to the hand, numbness/tingling in the hand, difficulty moving fingers, or increased pain. Prior to discharge, the patient was prescribed pain medication.

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Image 1. Muscles of the Forearm (Right Arm, Anterior Compartment)**Image 2. Muscles of the Forearm (Right Arm, Posterior Compartment)**

ion. A follow-up appointment with orthopedics was arranged for the next week.

Later in the day, the patient's mother called the ED because the patient was experiencing increasing pain. According to the physician (after the final diagnosis

was known), the staff stated that the patient did not show signs of compartment syndrome. The opioid pain medication was changed to a different agent, which the patient's mother acquired for him later that evening.

The following day, the patient was still experiencing significant pain. He returned to the ED with complaints of worsening pain and swelling in the left arm. At the second visit, the patient was diagnosed with acute compartment syndrome.

Epidemiology

Compartment syndrome is defined as "an increase in anatomical pressure within a defined myofascial compartment that exceeds the resting pressure of the capillary system."¹ Increasing pressure leads to collapse of vascular structures, impairing perfusion to local tissues, including muscles and nerves, which can lead to tissue ischemia and necrosis. The upper extremities account for more than 18% of observed cases.^{1,2}

Most frequently, acute compartment syndrome is caused by trauma. Swelling after trauma resulting from fractures, hematomas, and/or edema leads to increased pressure within the compartment or restriction of compartment expansion.^{1,2} The most common fracture patterns resulting in acute compartment syndrome include tibial plateau fractures (especially fractures to the medial plateau with the fracture line extending laterally) and tibial shaft fractures with fracture to the tibial diaphysis accounting for 36% of fractures resulting in compartment syndrome.^{2,3} Other fracture types

frequently resulting in acute compartment syndrome include the distal radius and diaphysis of the forearm bones.² Although compartment syndrome should be considered in these scenarios specifically, it is important to assess for increasing compartmental pressures in any

patient with extremity-related musculoskeletal pain and injury to avoid poor functional outcomes or permanent limb ischemia.

Relevant Anatomy

The upper extremity contains 15 compartments:^{2,4}

- Upper arm flexors
- Upper arm extensors
- Forearm volar (further broken down into superficial and deep layers)
- Forearm dorsal
- Forearm lateral (mobile wad)
- Hand hypothenar
- Hand thenar
- Hand adductor pollicis
- Hand dorsal interosseous (4)
- Hand volar interosseous (3)

The volar forearm is the most commonly affected compartment in the upper extremity with the deep volar muscles (flexor digitorum profundus, flexor pollicis longus, and pronator quadratus) most commonly damaged (**Images 1-2**).² The volar forearm compartment, along with the other compartments in the forearm, are enveloped in antebrachial fascia, which is a continuation of the brachial fascia in the upper arm.²

The more superficial volar muscles are less prone to ischemia.² The median, anterior interosseous, and ulnar nerve run within the volar compartment; the median nerve is the most commonly affected nerve in cases of forearm compartment syndrome due to its deeper course in the forearm.⁴

History

History of present illness is an important component of initial evaluation for suspected compartment syndrome. Clinicians should be sure to ask patients about timing and mechanism of injury, any recent causes of external compression (tight casts or bandages, circumferential burns, recent tourniquet use), any recent causes of tissue infiltration (recent IV infusions, infections), as well as any analgesic measures used prior to seeking treatment.^{1,2} Patients should also be asked about additional locations of pain and other injuries in addition to the chief complaint, as well as new or worsening symptoms including pain, numbness, tingling, change of color of the extremity, swelling, and change in temperature of the affected area.^{1,2}

Reviewing and confirming patients' past medical history, past surgical history, current prescription medication use and non-prescription medication use (with

special attention on medications that impair coagulation), time of most recent medication use, and social history is also important when assessing for possible compartment syndrome.

Physical Exam

The presentation of compartment syndrome can vary widely between patients and is a clinical diagnosis that can be confirmed by objective diagnostic testing. Physical exam of the extremity should include visual inspection (which may involve removal of splints or casts), palpation, active and passive range of motion assessment, and relevant tests depending on the joint(s) related to injury. Thorough assessment of neurovascular function is also critical.

The classic clinical hallmarks associated with compartment syndrome are the "6 Ps."^{2,4,5,6}

- Pain characteristically out of proportion to the injury (typically the first finding)
- Paresthesia
- Pallor
- Paralysis
- Pulselessness (typically the last finding)
- Poikilothermia (ie, coolness of the extremity, especially distal to the site of injury)

These clinical symptoms importantly rely on a normally conscious and undistracted patient.³ Other features suggestive of possible compartment syndrome include pain with passive stretch of the muscles contained within the compartment of concern and unexpected firmness of compartments on palpation.¹ Presence of skin manifestations—such as epidermolysis (loosening of the epidermal layer of skin), cutaneous bullae, and blistering—as well as the hand resting in the intrinsic position ("claw hand" with extension at the metacarpophalangeal joint and flexion at the interphalangeal joints) may be helpful indicators in these scenarios.⁵ By the time patients have these symptoms, they have likely already started to experience irreversible sequelae of increased compartmental pressures such as necrosis.³

Imaging and Diagnostic Testing

While compartment syndrome is a clinical diagnosis, certain imaging and testing modalities can be useful for confirmation of suspected compartment syndrome in cases of ambiguity.

- **Radiography:** XR imaging is useful in screening for bony injury after trauma. Comminuted fracture patterns may suggest higher risk for compartment syndrome.
- **Ultrasound:** Doppler ultrasound can be helpful in

“Acute compartment syndrome is an orthopedic emergency. If suspected in a UC setting, the patient should be immediately referred to an ED.”

ruling out a vascular occlusion causing pain and swelling to the extremity.⁹ While ultrasound does not support or rule out compartment syndrome, it is a relatively quick method to exclude venous or arterial thromboses from the differential. Ultrasound may also be used to check for distal peripheral pulses if not felt on palpation.

- **Magnetic Resonance Imaging (MRI):** While MRI can be used to evaluate further for muscle involvement and ischemic changes in settings of compartment syndrome, it is costly, may not be readily available, and can delay time to treatment.¹ Evidence of soft tissue swelling may be present on XR or MRI but is unreliable to support the diagnosis of compartment syndrome alone.¹
- **Compartment Pressure Measurement:** The predominant diagnostic modality for compartment syndrome is intracompartmental pressure measurement, usually with the STIC (solid-state transducer intracompartmental) monitor, colloquially termed the “Stryker needle.”³ This is a portable device that uses a side-ported needle and saline flush with a digital read-out manometer to allow for simple pressure measurements. This should be performed by an experienced operator as measurements can be affected by position, measuring location, and amount of tissue relative to the tip of the needle.³ Pressure may also not be uniform across a compartment. For example, pressure closest to fracture site or site of intracompartmental bleeding may be higher than at sites further from injury.^{3,7} These factors make measurement of intracompartmental pressure variable depending on clinician and patient, so they should not be used alone in the diagnosis of compartment syndrome. If using needle measurements to assist in diagnosis, the highest recorded pressure should be used when making decisions about management.⁷ Some guidelines have suggested that compartment pressures greater than 30 mmHg and/or a difference between diastolic

blood pressure and compartmental pressure of less than 20 mmHg is indicative of compartment syndrome, but these thresholds remain controversial.^{3,5}

Urgent Care Management

Acute compartment syndrome is an orthopedic emergency. If suspected in a UC setting, the patient should be immediately referred to an ED for further specialist-level assessment of compartment pressures. In cases of true compartment syndrome, time to fasciotomy heavily impacts likelihood of poor outcomes with muscle necrosis occurring in as little as 3 hours.³ For the forearm specifically, fasciotomy involves releasing the volar, dorsal, and mobile wad compartments.⁵ Pain medication such as opioids, if available, can be administered prior to ED referral or by paramedics if the patient is transported by ambulance. Any external compression of compartments via cast or splint should be removed as soon as compartment syndrome is suspected.

Next Level Urgent Care Pearls

- In cases concerning for compartment syndrome, UC clinicians should facilitate immediate referral to the ED. This should include calling ahead to the ED and giving report, ideally to the clinician who will be taking care of the patient.
- When referring the patient to the ED, be sure to confirm that the proper specialist will be available for potential fasciotomy shortly upon arrival. Needed specialists may include orthopedics, plastics, trauma, and/or hand surgery.
- Consider how the patient should be referred to the ED (ambulance vs private vehicle). It is important to advise patients to not drive if experiencing severe pain or neurologic deficits.

Red Flags and Legal Pitfalls

Studies of malpractice claims show that compartment syndrome is a diagnosis that is often missed or delayed. When analyzing patient perspectives in cases of medical malpractice, Bhattacharyya et al. (2004) noted that patients commonly reported physical exam findings that were subtle but not investigated further by clinicians.⁸ Other frequent allegations included delay in diagnosis, misdiagnosis of compartment syndrome, and poor documentation.⁸ Risk factors associated with a poor legal outcome for clinicians were identified as:⁸

- Clinician documentation of abnormal findings on neurological examination but no action taken
- Poor clinician communication (defined in this study as disregarded telephone calls, disregarded

nursing requests, poor communication among clinicians, or plaintiff testimony that the physician “did not listen”)

- Higher numbers of cardinal signs (pain, pallor, pulselessness, paralysis, pain with passive stretch)
- Increased time to fasciotomy (most prominent risk factor for indemnity payment)

Based on the Bhattacharyya study, when performing a physical exam on patients with possible compartment syndrome, each of these factors may be important to consider and document when looking to minimize medical malpractice risk. In addition, targeting strategies to improve clinician communication may be beneficial.

In the retrospective analysis of acute compartment syndrome cases by Marchesi et al. (2014), the authors found that the main early symptom of acute compartment syndrome was pain, described as intense, progressive, and intolerable, especially at rest.⁶ When considering analgesia, it is important to gauge patients’ pain at baseline and suspect compartment syndrome when pain worsens over time, especially without touch or movement and despite typical analgesia. Additionally, none of the clinicians in this study had access to a manometer to measure intracompartmental pressures.

Based on the Marchesi study, when unsure if a patient is experiencing acute compartment syndrome, continuous observation and monitoring in a hospital setting is suggested to watch for developing or changing symptoms. This may lead to fewer errors in diagnosis of compartment syndrome and less delay in time to fasciotomy.⁶

Clinical Scenario Conclusion

At the second ED visit, a diagnosis of compartment syndrome was made, and the patient underwent volar fasciotomy with debridement. Three days later, he had another surgical debridement, followed by additional plastic surgery. Postoperatively, he attended physical therapy. Despite this care, the patient suffered chronic muscle loss, loss of grip strength, and loss of sensation in the left hand.

The patient subsequently filed a medical malpractice allegation against the orthopedic surgeon, initial emergency medicine physician, and the hospital system. To establish medical malpractice in the state of Ohio—the state where this clinical scenario took place—“it must be shown by a preponderance of evidence that the injury complained of was caused by the doing of some particular thing or things that a clinician or surgeon of ordinary skill, care and diligence would not have done under like or similar conditions or circumstances, or by

“When unsure if a patient is experiencing acute compartment syndrome, continuous observation and monitoring in a hospital setting is suggested to watch for developing or changing symptoms.”

the failure or omission to do some particular thing or things that such a clinician or surgeon would have done under like or similar conditions and circumstances, and that the injury complained of was the direct and proximate result of such doing or failing to do some one or more of such particular things.”⁹

At trial, multiple orthopedic surgery and emergency medicine expert witnesses testified, with the outcome ruling in favor of the physician and ED group. A jury decided that the initial ED physician did comply with the accepted standard of care of a reasonably prudent emergency room physician when treating the patient. The case was appealed with the original decision being upheld.¹⁰

Although the physician was not found liable, there were some instances of opportunities for improvement in care and documentation that emerged from trial proceedings. These include the following:

- Earlier suspicion for compartment syndrome, given the mechanism of injury
- Recognizing the presence of increasing pain over time (that may or may not be in proportion to physical findings), suggesting a developing compartment syndrome
- Obtaining a formal orthopedic consultation as soon as concern for compartment syndrome arose and documenting what was discussed as well as the specific recommendations of the orthopedic surgeon
- Obtaining compartment measures of the injured arm
- Re-evaluating the patient before prescribing an alternative pain medication
- Providing the patient with specific discharge instructions and information about compartment syndrome so that they can monitor for new or worsening symptoms

- Admitting the patient to the hospital for observation if they are unable to monitor for new or worsening symptoms on their own or are unable to return to the UC/ED on their own

Ethics Statement

Attempts to contact the patient for presentation of this case were unsuccessful, and therefore some details of the case were changed to protect patient anonymity and confidentiality.

Takeaway Points

- Acute compartment syndrome is an orthopedic emergency. If suspected, patients should be referred to the ED for immediate orthopedic surgery consultation.
- Patient presentation concerning for acute compartment syndrome can be widely variable in signs and symptoms. Increasing pain, especially without movement, is an early finding, and pulselessness is a late finding.
- Time to fasciotomy is the most important factor in long-term functional outcomes of patients, as well as being the most prominent risk factor for indemnity payment in medical malpractice cases. ■

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References

1. Miranda-Klein J, Howell CM, Davis-Cheshire M. Recognizing and managing upper extremity compartment syndrome. *JAAPA*. 2020;33(5):15-20. doi:10.1097/01.JAA.0000660124.51074.e5
2. Prasarn ML, Ouellette EA. Acute compartment syndrome of the upper extremity [published correction appears in *J Am Acad Orthop Surg*. 2011 May;19(5):50A]. *J Am Acad Orthop Surg*. 2011;19(1):49-58. doi:10.5435/00124635-201101000-00006
3. Guo J, Yin Y, Jin L, Zhang R, Hou Z, Zhang Y. Acute compartment syndrome: Cause, diagnosis, and new viewpoint. *Medicine (Baltimore)*. 2019;98(27):e16260. doi:10.1097/MD.00000000000016260
4. Kistler JM, Ilyas AM, Thoder JJ. Forearm Compartment Syndrome: Evaluation and Management. *Hand Clin*. 2018;34(1):53-60. doi:10.1016/j.hcl.2017.09.006
5. Friedrich JB, Shin AY. Management of forearm compartment syndrome. *Hand Clin*. 2007;23(2):245-vii. doi:10.1016/j.hcl.2007.02.002
6. Marchesi M, Marchesi A, Calori GM, et al. A sneaky surgical emergency: Acute compartment syndrome. Retrospective analysis of 66 closed claims, medico-legal pitfalls and damages evaluation. *Injury*. 2014;45 Suppl 6:S16-S20. doi:10.1016/j.injury.2014.10.017
7. Heckman MM, Whitesides TE Jr, Grewe SR, Rooks MD. Compartment pressure in association with closed tibial fractures. The relationship between tissue pressure, compartment, and the distance from the site of the fracture. *J Bone Joint Surg Am*. 1994;76(9):1285-1292.
8. Bhattacharyya T, Vrahas MS. The medical-legal aspects of compartment syndrome. *J Bone Joint Surg Am*. 2004;86(4):864-868. doi:10.2106/00004623-200404000-00029
9. *Bruni v. Tatsumi*. Supreme Court of Ohio. 1976.
10. *Kendig v. Martin*. Ohio Court of Appeals. 2003.

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Brief Report: PrEPare for Action - A Quality Improvement Project for Expanding HIV Screening in the Urgent Care Setting During the COVID-19 Pandemic

Urgent Message: A quality improvement program demonstrated the successful integration of HIV services into urgent care, achieving a higher consent rate than traditional settings.

Erin Hunt, PA; Megan Greger, PA; Neal Shipley MD, MBA, FACEP

Citation: Hunt E, Greger M, Shipley N. Brief Report: PrEPare for Action - A Quality Improvement Project for Expanding HIV Screening in the Urgent Care Setting During the COVID-19 Pandemic. *J Urgent Care Med.* 2025; 19(9): 21-23

Abstract

Introduction: The COVID-19 pandemic caused significant disruptions in human immunodeficiency virus (HIV) screening and prevention in the United States, leading to declines in diagnoses and preexposure prophylaxis (PrEP) prescriptions. To address this issue, a quality improvement program was launched in urgent care centers in New York City, to explore their role in HIV screening and PrEP counseling. The goal was to improve access, reduce barriers, and lower HIV transmission by integrating these services into urgent care.

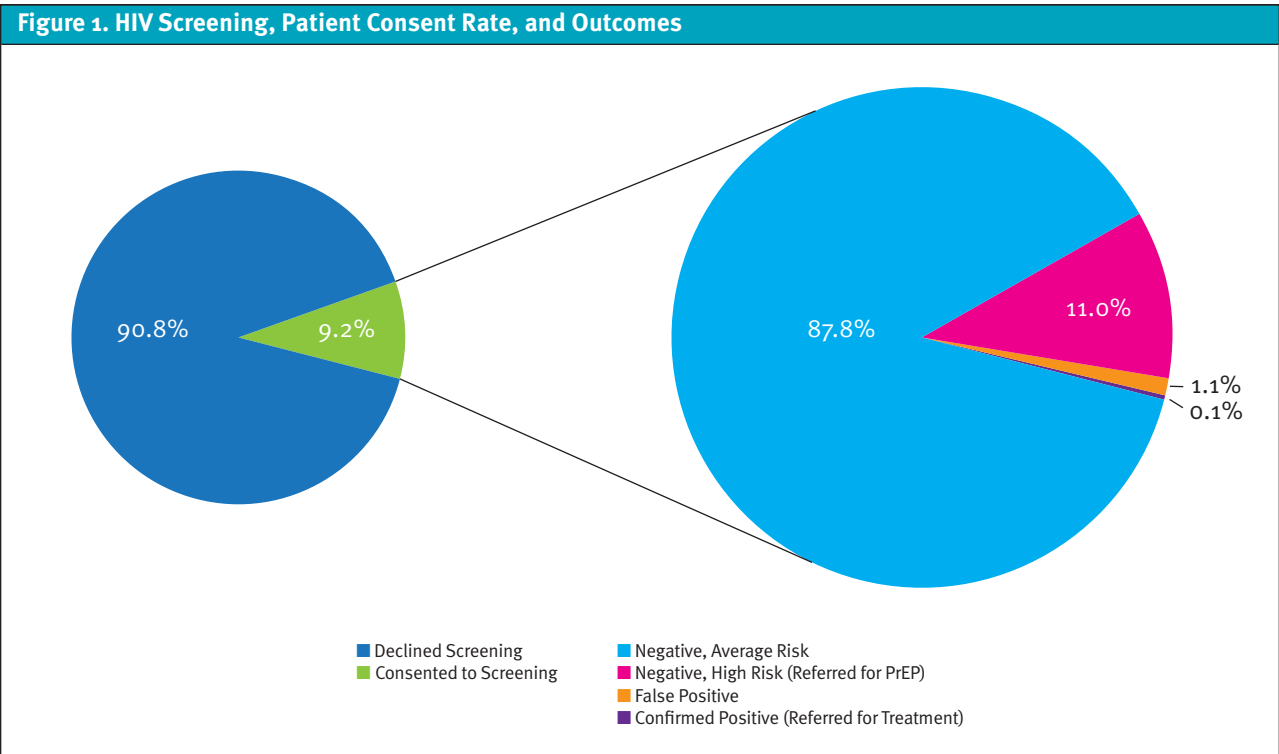
Methods: The program involved 2,800 rapid HIV tests distributed across 17 urgent care sites in the boroughs of Manhattan, Brooklyn, and Queens. Staff were trained in point-of-care testing and risk assessments using inclusive language. Adult patients were offered free HIV screening. Those who tested negative for HIV but were deemed to be high risk for contracting HIV were referred for PrEP. Preliminary positive HIV test results were referred for specialist consultation and confirmatory testing. Data collection was embedded in the electronic



medical record system, and throughput times were tracked to evaluate operational efficiency.

Results: From April 2023 to May 2024, 17,439 patients

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were approached with a 9.2% testing consent rate. Nineteen preliminary positives resulted in 2 confirmed cases. Additionally, 11% of participants were referred for PrEP services. The false positive rate was within the expected range at 1.1%, mainly due to sample processing issues. Evaluation of throughput times indicated no impact on efficiency.

Conclusion: This program demonstrates the success of integrating HIV services into urgent care, achieving a higher consent rate than traditional settings. The findings highlight the crucial role of urgent care centers in expanding access to HIV prevention and surveillance.

Introduction

During the COVID-19 pandemic, human immunodeficiency virus (HIV) screening and prevention efforts in the United States were significantly impacted with a 32% decrease in HIV diagnoses and a 6% drop in pre-exposure prophylaxis (PrEP) prescriptions in 2020 compared to the previous year.¹ As traditional healthcare settings faced challenges, urgent care centers saw a surge in patient volumes, serving as a crucial alternative for care.

To evaluate the use of urgent care facilities for HIV screening and PrEP counseling, a quality improvement program was developed with aims to enhance accessibility, reduce barriers, and contribute to lowering HIV

transmission rates. This study examines the feasibility and impact of integrating HIV prevention and surveillance in the urgent care setting.

Methods

A total of 2,800 HIV-1/2 Ab/Ag rapid tests from Abbott Rapid Diagnostics were distributed evenly among 17 Northwell Health - GoHealth Urgent Care facilities located across the New York City boroughs of Manhattan, Brooklyn, and Queens. Clinical teams were trained to conduct point-of-care (POC) HIV testing and administer HIV risk assessments using inclusive and nonjudgmental language.

All patients aged 18 years and older seeking urgent care services were offered HIV screening as a supplementary service at no additional cost during the triage process. HIV risk stratification was performed for all patients consenting to screening. Individuals were classified as high risk for contracting HIV compared to the general population if they met any of the following criteria: engaging in intravenous drug use; identifying as a man who has sex with men; having multiple sexual partners; having a sexual partner with HIV who has a detectable viral load; having a history of any sexually transmitted infection (STI) within the past 6 months; or engaging in unprotected vaginal or anal intercourse

outside of a monogamous relationship. Individuals testing negative but deemed high risk for contracting HIV received counseling and referrals for PrEP services. Those testing as preliminarily positive underwent confirmatory HIV testing, and if confirmed, were directed to an infectious disease (ID) specialist for further evaluation and treatment.

Data collection was facilitated through tailored templates within the electronic medical record (EMR) system. Door-to-door (D2D) times (ie, total time patients were in the urgent care center) were monitored to evaluate operational efficiency. We compared D2D times across the 17 centers enrolled in the quality improvement program (test sites) to those at the remaining 44 centers within the Northwell Health – GoHealth Urgent Care market (control sites) during the same period. Data was analyzed using an independent 2-sample t-test to determine whether any changes in D2D times between the 2 groups were statistically significant. A p-value of <0.05 was considered significant.

Institutional review board approval was not sought for this quality improvement project as it did not fall under the definition of human subject research. Data was collected and analyzed as a pre-planned aspect of the quality improvement project.

Results

The quality improvement project ran from April 2023 through May 2024. HIV screening was offered to 17,439 patients, with 1,596 (9.2%) opting in to testing. Nineteen patients tested preliminarily positive; individuals who were confirmed HIV positive (0.1%) were referred for further evaluation and treatment. Of those testing negative, 175 individuals (11%) were identified as high risk and were referred for PrEP services. The false positive rate was within the expected range at 1.1%. (Figure 1) False positive results were attributed to multiple factors. Eighteen percent of false positives were attributed to sample contamination at a specific site. Our investigation into this revealed that the countertop used for processing specimens had been contaminated with positive control fluid, leading to a high false positive rate at that one location. Additional causes, as identified in the test kit's package insert, included incorrect storage of test kits, specimens containing elevated levels of triglycerides, and specimens from patients with concurrent herpes simplex virus infection.²

The D2D times revealed no statistically significant difference between the test sites and control sites, with test sites averaging just 1.7 minutes longer (p=0.37). This suggests that there was no strain on operational

efficiency. Because testing began during triage, the results were ready for the provider to discuss with the patient by the start of their evaluation, minimizing the impact of this workflow on D2D time.

“This notably higher consent rate demonstrates the practicality and effectiveness of incorporating HIV services into the urgent care setting.”

Conclusion

The COVID-19 pandemic created a gap in access to HIV screening and prevention services for at-risk populations. This quality program achieved a 9.2% consent rate, which is markedly higher than the rates seen in physician offices (0.59%), emergency departments (0.95%), and community health centers (3.74%) in the northeastern United States.³ This notably higher consent rate demonstrates the practicality and effectiveness of incorporating HIV services into the urgent care setting. With a 9.2% testing consent rate, 11% PrEP referral rate, and 0.1% HIV diagnosis, urgent care centers are essential for expanding access to timely and effective HIV prevention and surveillance. ■

Disclosures

A grant was received from Abbott Rapid Diagnostics, providing Determine HIV-1/2 Ab/Ag rapid tests at no expense.

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References

1. Hoover KW, Zhu W, Gant ZC, et al. HIV Services and Outcomes During the COVID-19 Pandemic — United States, 2019–2021. *MMWR Morb Mortal Wkly Rep* 2022;71:1505–1510. DOI: <http://dx.doi.org/10.15585/mmwr.mm7148a1>.
2. Determine HIV-1/2 Ag/Ab COMBO. Package insert. Abbott Rapid Diagnostics. 2021. <https://www.fda.gov/media/86959/download>
3. Hoover KW, Huang YA, Tanner ML, et al. HIV Testing Trends at Visits to Physician Offices, Community Health Centers, and Emergency Departments — United States, 2009–2017. *MMWR Morb Mortal Wkly Rep* 2020;69:776–780. DOI: <http://dx.doi.org/10.15585/mmwr.mm6925a2>

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Dyspnea in an Asthmatic Patient Following an Influenza Infection: A Case Report

Urgent Message: While patients with asthma will frequently experience exacerbations following viral respiratory infections, the urgent care clinician must be cautious when assuming dyspnea is due to asthma. As dyspnea can be caused by a wide variety of conditions, it is important to maintain a broad differential diagnoses, even in patients with underlying asthma.

Tracey Quail Davidoff, MD, FCUCM

Key words: Influenza, Dyspnea, Asthma, Congestive Heart Failure, Myocarditis, Diagnosis Momentum

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Abstract

Introduction: Patients commonly present to urgent care (UC) following respiratory infections. Co-morbidities and patient perceptions may complicate the evaluation and lead to cognitive bias.

Case Presentation: A 45-year-old woman with a history of asthma, hypertension, and anxiety presented to UC 1 month after a documented influenza A infection with a chief complaint of gradually worsening dyspnea, weakness, fatigue, and dizziness. She had been seen by 2 clinicians previously for her symptoms and received standard asthma treatment without improvement.

Physical Exam: Exam findings included tachypnea and tachycardia without wheezing.

Case Resolution: Based on the patient's severe dyspnea



despite adequate treatment for asthma, as well as symptoms of weakness and dizziness, the patient was sent to the emergency department (ED) after her third UC visit. Hospital evaluation revealed systolic heart failure with a left ventricular ejection fraction (LVEF) of <20%, likely due to viral myocarditis.

Author Affiliations: Tracey Quail Davidoff, MD, FCUCM, Baycare Urgent Care, Florida State University College of Medicine, *Journal of Urgent Care Medicine*. Author has disclosed past financial relationships (consultant) with Pfizer and AstraZeneca within the past 24 months. These relationships have ended, and any potential conflicts of interest have been mitigated through independent peer review to ensure objectivity and lack of bias.

Conclusion: It is critical for UC clinicians to be aware of serious complications of viral infections, including myocarditis, even though they may be uncommon. Early recognition of the complications of influenza may lead to better outcomes, less morbidity, and less mortality.

Introduction

Although most cases of influenza are mild and self-limited, a small proportion of patients may have serious complications. Patients at the extremes of age and those with comorbidities are at increased risk for such complications.¹ Patients with asthma are susceptible to exacerbations due to acute respiratory infections, including influenza.² Cognitive bias, such as diagnosis momentum can cause delay in diagnosis. Failure to achieve a timely diagnosis as a result of these biases may expose patients to increased risk.

When patients present with a chief complaint worded as a diagnosis—especially after multiple visits—clinicians need to be extremely cautious, making sure that history elements, physical findings, and in some cases, response to treatment support that diagnosis. If they do not, a more careful evaluation for an alternate diagnosis should be sought.

Case Presentation

A 45-year-old woman with a past medical history of asthma, hypertension, and anxiety presented to UC with a chief complaint of asthma following an influenza A infection. After the resolution of her acute influenza symptoms, she began to feel progressively short of breath. Because of her history of asthma, she assumed this was related to an asthma exacerbation. However, after her dyspnea failed to improve with albuterol, she sought care with her primary care provider (PCP) who diagnosed her with an asthma exacerbation and prescribed a methylprednisolone dose pack as well as azithromycin in addition to her albuterol rescue inhaler.

The patient continued to feel worse despite the addition of systemic steroids, and she sought further care at a local UC center. At the second visit, she was again diagnosed with an asthma exacerbation and was given a second course of oral steroids and a course of azithromycin. Following that visit, she noted that her legs became very swollen after a long car trip and her dyspnea became worse. She elevated her legs, drank fluids, and avoided salt. The swelling improved, but the increased shortness of breath persisted. She was using her albuterol inhaler every 3 hours without effect.

Finally, 5 weeks after her initial influenza diagnosis,

she presented to a second UC facility with a chief complaint of asthma. She stated she was so dyspneic she could barely get dressed to come to the office. She had no complaints of chest pain, fever, or cough. She requested a chest x-ray (CXR), a longer course of steroids, and a nebulizer for home use.

The patient reported that her home medications included albuterol, ibuprofen as needed, escitalopram 10 mg daily, and trazodone. She admitted to non-adherence with her antihypertensive medication and denied smoking and illicit drug use.

“When patients present with a chief complaint worded as a diagnosis—especially after multiple visits—clinicians need to be extremely cautious, making sure that history elements, physical findings, and in some cases, response to treatment support that diagnosis.”

Clinical Findings and Physical Exam

On examination, the patient's vitals were: heart rate 121 beats per minute; respiratory rate 32 breaths per minute; and blood pressure 156/96 mmHg. Her oxygen saturation was 100% on room air, and she was afebrile.

She appeared moderately ill and dyspneic and was leaning forward in the chair.

Her head and neck exam revealed no rhinorrhea or pharyngeal erythema. Her heart rate was tachycardic but was thought to be regular. She had trace pedal edema bilaterally. Lung auscultation revealed no wheezing or rhonchi bilaterally; however, she was unable to speak in full sentences.

Differential Diagnosis

The differential diagnosis considered included asthma exacerbation, heart failure due to viral myocarditis or post-myocardial infarction related to influenza, arrhythmia (such as atrial fibrillation), deep venous thrombosis

with pulmonary embolus, hypertensive emergency with pulmonary edema, and post-influenza bacterial pneumonia. Due to the absence of wheezing or prolongation of the expiratory phase, as well as normal oxygen saturation despite severe symptoms, asthma was thought to be unlikely. Her failure to improve despite adequate asthma treatment made reactive airway disease unlikely. Although she was tachycardic, her rhythm was regular, making arrhythmia less likely. Her blood pressure was elevated, but it was not thought to be high enough to cause a hypertensive emergency. Pneumonia was also thought to be less likely with this history. Ultimately, the UC clinician thought the patient required ED evaluation in lieu of pursuing further work-up in UC. Against the advice of the UC clinician, the patient declined ambulance transport and drove herself to the ED, which was only a few minutes from the UC center.

Case Continuation and Outcome

In the ED, an electrocardiogram (ECG) showed sinus tachycardia, left atrial enlargement, and non-specific T-wave changes. A CXR was interpreted as normal. Laboratory studies included a normal complete blood count (CBC), and comprehensive metabolic panel (CMP). The B-type natriuretic peptide (BNP) returned elevated at 1754.8 pg/mL (0-100) and high-sensitivity troponin (hsTn) was also abnormal at 63 pg/mL (0-14). A d-dimer was significantly elevated, prompting a computed tomography-angiogram (CT-A) of the chest. While the CT-A was negative for pulmonary emboli, cardiomegaly was identified.

The patient was admitted and subsequently underwent a transthoracic echocardiogram (TTE) that showed no valvular or focal wall motion abnormalities, however there was notable dilation of the left ventricle with an ejection fraction (LVEF) estimated between 20-30%. The patient was treated with furosemide and improved with diuresis.

Ultimately, cardiac magnetic resonance imaging (MRI) was consistent with viral myocarditis and confirmed a severely depressed LVEF of <20%. After several days of diuresis, the patient's symptoms had improved, and she was discharged home with a temporary external defibrillator vest and prescriptions for lisinopril, furosemide, potassium supplement, and compression stockings. She remains on medical management while awaiting a heart transplant.

Discussion

Although most patients recover from influenza uneventfully, complications do occur and can be seen in

UC. The most common complications occur in the respiratory tract³ and include pneumonia, bronchitis, sinusitis, and otitis media. In patients with asthma, exacerbations are also quite common following influenza infection and may result in significant morbidity and even mortality.⁴ Patients with underlying coronary disease are at an increased risk for myocardial infarction, and patients with heart failure are at increased risk of decompensation. Myocarditis and pericarditis can occur after many viral infections, including influenza.^{5,6} In a 2020 study published in *Annals of Internal Medicine*, the authors found that 11.7% of hospitalized patients with influenza experienced an acute cardiac event. The most common of these being heart failure and ischemic events.⁷

“Although most patients recover from influenza uneventfully, complications do occur and can be seen in UC.”

Epidemiology

Older patients and those with co-morbidities such as tobacco use, cardiovascular disease, diabetes, and renal disease are at increased risk for cardiac complications due to influenza.⁷ A study that included more than 1 million patients with COVID-19 and more than 600,000 with influenza found the overall risk of myocarditis due to COVID-19 was 0.06%, whereas the risk associated with influenza was 0.02%.⁸ In COVID-19, the risk in younger males was disproportionately higher. In influenza, however, the incidence in males and females was equal, and older patients were more likely to be affected with the highest incidence being among patients >70 years. Patients with prior cardiac disease were also found to be at an increased risk of influenza-related myocarditis. The median time from onset of infection to the diagnosis of myocarditis in COVID-19 was 30 days versus 20 days in cases associated with influenza. There was a decreased risk of myocarditis in vaccinated patients for both COVID-19 and influenza.⁸

Testing

Diagnostic testing for viral myocarditis may be challenging as ECG findings are nonspecific and may in-

clude sinus tachycardia, low amplitude QRS complexes, AV nodal or bundle branch blocks, ST-segment changes, and Q waves. ECG results are also often dynamic and change through the course of the illness.⁸ Troponin levels are often elevated, however, a normal troponin does not exclude the diagnosis. Echocardiographic findings are also variable and can range from normal to focal or global hypokinesis. Echocardiography may also detect pericardial effusion, septal thickening, and left, right, or global ventricular dysfunction with low ejection fraction; these are also nonsensitive and nonspecific.⁸

Endomyocardial biopsy and cardiac MRI are the diagnostic tests of choice for myocarditis.⁵ Endomyocardial biopsy findings are helpful if positive but may miss the involved endomyocardial site producing a false negative result. Clinical correlation is important in making the diagnosis.⁶ Additionally, positron emission tomography (PET) scanning has been shown increasingly to have promise in the diagnosis of viral myocarditis. PET scanning, however, can also be difficult to obtain and can identify active inflammation but cannot confirm the specific cause.⁸

Presentation

Myocarditis frequently results in dilated cardiomyopathy with outcomes ranging from complete recovery to severe heart failure and death. Some 50-70% of cases of myocarditis are due to viral infections. Pathogenesis is believed to be related to a maladaptive post-viral response causing myocardial cell dysfunction and compromised contractility.⁵ Other causes of myocarditis include bacterial and protozoal infections, toxins, autoimmune disorders, and hypersensitivity reactions.⁶

Fulminant myocarditis (FMC) is a rare complication of viral myocarditis with an acute, rapid onset of hemodynamic compromise and extensive myocardial inflammation over a few days that is treatment resistant and requires ventilatory and mechanical circulatory support. Arrhythmias are common. Despite the severity, there is a high likelihood of complete recovery of ventricular function if the patient survives the acute episode.⁶

The patient presented in this case was repeatedly presumed to be suffering from an asthma exacerbation. This was due to cognitive bias. Diagnosis momentum refers to situations in which clinicians assume a previous diagnosis from another healthcare provider—as was relayed by the patient in this case—is responsible for the current constellation of symptoms, thereby foregoing development of an appropriate differential diagnosis.^{9,10} With subsequent visits and reinforcement, the initial diagnostic label becomes increasingly “sticky.”^{9,11} Each

successive clinician is more vulnerable to adopting the initial impression, often despite increasing evidence to the contrary. This can lead to a possibility of diagnostic error as symptoms, physical findings, or test results that do not fit with the erroneous diagnosis are dismissed when they do not align with that diagnosis.^{9,11} It is important that clinicians be aware of this human tendency to prematurely arrive upon the most convenient explanation for a patient’s presentation. Awareness of these biases is critical to keeping an open-minded approach allowing thorough evaluation of all information before deciding whether a prior diagnosis is accurate.

In this case, the patient failed to improve with standard asthma treatment, which may be a red flag that an alternate condition may be at play. Physical findings did not support the diagnosis of asthma. Although some patients with severe bronchospasm or significant hyperinflation may have little air movement resulting in clear lung sounds, it would be unusual to have no wheezing and no prolonged expiratory phase in a patient experiencing asthma even after treatment. This is also an indication that an alternate diagnosis may exist.

Diagnosis momentum is a cognitive bias increasingly recognized in both acute care and primary care settings.⁹ Diagnosis momentum may be exacerbated further by the modern phenomenon of patient’s ability to research their symptoms online. Use of internet medical references leads many patients to arrive upon a presumed diagnosis before ever seeking a clinician’s opinion.¹² It is particularly important for clinicians to remain vigilant in history taking and data gathering to ensure their ultimate conclusion to accept or refute the patient’s self-diagnosis is substantiated appropriately.

Conclusion

Viral respiratory infections are among the most common illnesses encountered in UC medicine. Although the overwhelming majority of patients will recover uneventfully, some will suffer complications, which rarely may be serious or even life-threatening. UC clinicians should be aware of these rare but potentially serious complications and ensure that presumptive diagnoses are re-examined when patients fail to follow the expected clinical course. Awareness of diagnosis momentum and other cognitive biases that predispose to diagnostic errors is the first step to mitigating their harmful effects. Furthermore, UC clinicians should “trust but verify” when confronted with a patient with a presumed diagnosis, especially when the patient’s presentation does not conform to expected patterns for that condition.

Ethics Statement

The patient was unable to be reached for consent to publish this case report. Some details irrelevant to the educational content were changed to protect patient privacy.

Takeaway Points for Urgent Care Clinicians

- Patients commonly present with ongoing symptoms related to influenza infection and, while rare, serious sequelae should be considered if a patient's condition worsens during a period when recovery is expected.
- Abnormal vital signs are a red flag for more serious disease. These abnormalities should be fully explained and may require emergency department evaluation.
- Cognitive biases such as diagnosis momentum are natural tendencies that predispose clinicians to diagnostic error. Awareness of situations that are prone to bias and undertaking caution during such visits are crucial for reducing the risk of potentially hazardous errors. ■

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References

1. Uyeki TM, Bernstein HH, Bradley JS, et al. Clinical practice guidelines by the Infectious Diseases Society of America: 2018 update on diagnosis, treatment, chemoprophylaxis, and institutional outbreak management of seasonal influenza. *Clin Infect Dis*. 2019;68(6):e1-e47. doi:10.1093/cid/ciy866
2. Atmar RL, Guy E, Guntupalli KK, et al. Respiratory Tract Viral Infections in Inner-City Asthmatic Adults. *Arch Intern Med*. 1998;158(22):2453–2459. doi:10.1001/archinte.158.22.2453
3. Metersky ML, Masterton RG, Lode H, File TM Jr, Babinchak T. Epidemiology, microbiology, and treatment considerations for bacterial pneumonia complicating influenza. *Int J Infect Dis*. 2012 May;16(5):e321–31. doi: 10.1016/j.ijid.2012.01.003. Epub 2012 Mar 2. PMID: 22387143.
4. Schwarze J, Openshaw P, et al. Influenza burden, prevention, and treatment in asthma, a scoping review by the EAACI Influenza in asthma task force. *Eur J All Clin Immunol*. 73:6, June 2018, 1151–1181.
5. Pollack A, Kontorovich AR, Fuster V, Dec GW. 2015. Viral myocarditis—diagnosis, treatment options, and current controversies. *Nature Reviews Cardiology*. 12(11), pp.670–680.
6. Baral N, Adhikari P, Adhikari G, Karki S. Influenza Myocarditis: A Literature Review. *Cureus*. 2020 Dec 10;12(12):e12007. doi: 10.7759/cureus.12007. PMID: 33437555; PMCID: PMC7793451.
7. Chow EJ, Rolfe MA, O'Halloran A, et al. Acute Cardiovascular Events Associated With Influenza in Hospitalized Adults: A Cross-sectional Study. *Ann Intern Med*. 2020;173:605–613. [Epub 25 August 2020]. doi:10.7326/M20-1509
8. Magyar K, Halmosi R, Toth K, Alexy T. Myocarditis after COVID-19 and influenza infections: insights from a large data set. *Open Heart*. 2024;11:e002973.
9. Joseph MM, Mahajan P, et al. Optimizing pediatric patient safety in the emergency care setting. *Pediatrics*. 2022;150(5):e2022059674. Doi:10.1542/peds.2022-059674
10. Croskerry P. The Importance of Cognitive Errors in Diagnosis and Strategies to Minimize Them. *Academic Medicine. Journal of the Association of American Medical Colleges*. 2003;78(8):775–80. doi:10.1097/00001888-200308000-00003. [PMID: 12915363]
11. Rogers SO, Kirton OC. Acute Abdomen in the Modern Era. *NEJM*. 2024;391(1):60–67. Doi:10.1056/NEJMra2304821.
12. Veitch PC. A comparison of patient-reported reasons for encounter and provider-reported diagnoses. *Fam Pract*. 1195 Dec;12(4):408–12. doi:10.1093/famppra/12/4/408. PMID:8826056



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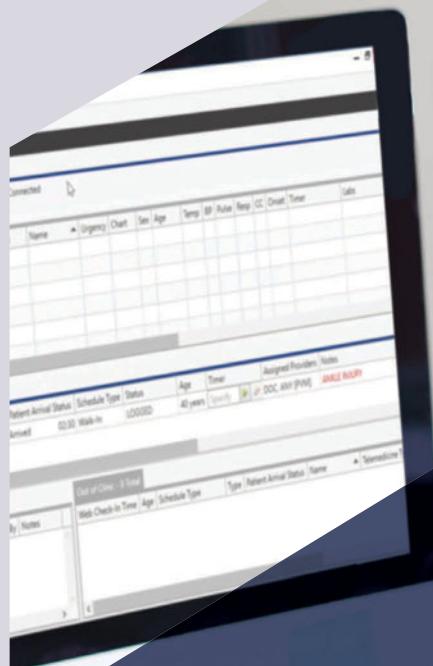
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Herpes Simplex Virus Infections: An Overview of Testing for the Urgent Care Clinician

Urgent Message: Polymerase chain reaction testing is recommended for patients with lesions that could represent herpes simplex virus infection. It is imperative that urgent care clinicians understand the utility and characteristics of such testing as well as the implications of findings.

Brittney Tice, FNP, DNP; Joseph Something, PA; Benjamin Zimmerman, PhD

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Editor's Note: The patient case scenario is hypothetical.

Abstract

In the urgent care (UC) setting, patients commonly present with nominal requests for herpes simplex virus (HSV) testing. HSV infections are common, pleomorphic, and associated with significant stigma. This combination creates a situation where decisions regarding which, if any, test(s) to obtain can be highly impactful for the mental health of patients and their romantic partners. It is imperative that UC clinicians understand the utility and test characteristics of HSV testing and the implications of findings before ordering testing. Given that both HSV-1 and HSV-2 are chronic infections, serologic testing results have the potential for lifelong consequences and should only be obtained in settings where clinically indicated and with appropriate patient counseling.

Clinical Scenario

A 42-year-old man presented to UC requesting a “blood test for herpes.” The patient denied genital lesions, pro-



dromal symptoms, or other genitourinary (GU) complaints. Upon further questioning, the patient stated he had concern for HSV-2 specifically after finding out that his partner had tested positive for HSV-2 by serology.

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Table 1. Herpesviridae Family That Infects Humans^{3,5}

Herpes Virus	Name/Associated Diseases	Seroprevalence
HSV-1 (Herpes Simplex Virus)	Causes cold sores, genital herpes, and infrequently encephalitis	~ 67% of individuals globally aged 0-49 years
HSV-2 (Herpes Simplex Virus)	Causes genital herpes and infrequently meningitis	~ 417 million individuals globally (11.3%) aged 15-49 years
HHV-3 (Varicella-Zoster Virus, VZV)	Causes chickenpox and shingles	In temperate regions without vaccination, more than 90% of individuals become infected by the age of 12
HHV-4 (Epstein-Barr Virus, EBV)	Causes infectious mononucleosis, associated with malignancies	90–95% of adults are seropositive.
HHV-5 (Cytomegalovirus, CMV)	Common infection, varies by region	In developed countries, ~60% of adults show seroprevalence, while in developing countries, it reaches nearly 100%
HHV-6 (Roseola virus)	Associated with roseola infantum and febrile illnesses in children	Seroprevalence research indicates that between 70% and 100% of children globally contract HHV-6B by the age of 2
HHV-7 (Roseola virus)	Associated with roseola infantum and febrile illnesses in children	Over 90% of adults have evidence of previous infection serologically
HHV-8 (Kaposi Sarcoma-Associated Herpesvirus, KSHV)	Associated with Kaposi sarcoma	The epidemiology of HHV-8 differs by region, but overall, seroprevalence gradually rises with age, resulting in ~50% of individuals testing seropositive by the age of 50

His vital signs, general appearance, and GU exam were normal. The clinician evaluating him agreed to order a serologic immunoglobulin G (IgG) test for HSV. The results returned with a slightly elevated HSV-2 IgG titer. When the patient was called the following day with test results, he expressed significant anxiety and had many questions about the meaning of his test results.

Introduction

HSV-1 and HSV-2 are 2 of the 8 members of the *Herpesviridae* family that infect humans (**Table 1**). This family also includes varicella-zoster virus (VZV), cytomegalovirus (CMV), Epstein-Barr virus (EBV), and human herpesviruses 6-8.^{1,2} The herpesvirus family causes a wide range of infections with distinct clinical manifestations, but this article will focus on considerations for testing for HSV-1 and HSV-2 in patients presenting to UC.³

HSV-1 and HSV-2 infections are highly prevalent worldwide with over 4.2 billion people infected. HSV-1 is more common with an estimated 3.7 billion people living with the virus compared to an estimated 490 million living with HSV-2.⁴ Genital infections specifically are more commonly caused by HSV-2 but can be caused by either virus.⁵ In a 2020 study looking at 15-49 year olds, HSV-1 was estimated to be responsible for

approximately 40% of genital HSV (gHSV) infections.⁵ For both HSV-1 and HSV-2, the prevalence was found to be higher in females.⁵

In the United States, there are roughly 96 million people believed to be chronically infected with HSV-1 that are in the age group of 14-49 years old.⁶ For the same age group, there are 24.2 million people infected with HSV-2. Additionally, HSV-1 affects about 48% of Americans overall and is typically associated with oral lesions. In contrast to HSV-1, HSV-2 rarely will cause orolabial infection and primarily affects the genital and anorectal areas. Approximately 12% of Americans have chronic HSV-2 infection.⁷

In UC settings, asymptomatic patients commonly request “herpes testing,” usually referring to serologic testing in the absence of active lesions. Patients are most commonly concerned with HSV-2 testing due to the stigma surrounding the virus.⁸ It is the UC clinician’s responsibility to ensure patients understand the limitations of HSV-2 testing and when it may have clinical utility. The goal of this article is to clarify for clinicians when serologic testing is and is not recommended, especially as testing without appropriate indication can be harmful.

Background

HSV-1 and HSV-2 are common and chronic. There are rare, serious medical consequences associated with HSV infections, however, infection commonly has considerable impact on the mental health of those afflicted.⁹ The prevalence of HSV-2 infection in UC environments has not been specifically studied. However, when studied in the urban emergency department setting in Baltimore, the seroprevalence of HSV-2 was high (~54%).¹⁰ This suggests that particularly in urban settings, there is a critical need for guidelines around targeted testing and treatment.

While the rates of HSV-2 appear to be declining,¹¹ the true seroprevalence of HSV-2 is difficult to know for certain as current guidelines do not recommend routine serologic testing, and many patients are believed to be asymptotically infected.¹² HSV-2 prevalence varies based on demographics, sexual practices, and underlying co-morbidities. The prevalence of HSV-2 is higher in women and those co-infected with human immunodeficiency virus (HIV).^{13,14}

Manifestations of HSV Infection

After initially infecting epithelial cells, HSV will typically transition to a latent state residing in the ganglia of peripheral neurons.¹ Both HSV-1 and HSV-2 can be transmitted even in the absence of active skin lesions due to a phenomenon known as “asymptomatic viral shedding.”^{15,16}

Most individuals with both HSV-1 and HSV-2 infection are asymptomatic. However, when symptoms are present, HSV-1 and HSV-2 can cause recurrent lesions of the oral or genital region.^{15,16} HSV-1 is typically linked to oral infections commonly referred to as “cold sores” or “fever blisters.” However, HSV-1 can also cause genital herpes (gHSV) in cases of oral-genital contact. Historically, orolabial herpes infection was typically attributed to HSV-1, whereas genital infection was attributed to HSV-2. In recent years, however, HSV-1 has become increasingly recognized as a cause of urogenital herpes infection.¹⁷ HSV-1 is becoming more common on the genitals, especially for young women and men who have sex with men.¹⁶

The incubation period of both HSV-1 and HSV-2 is 4–7 days.¹⁸ The lesions can be polymorphic, but in the classic presentation, they progress from flat spots and raised bumps to blisters, pustules, and ulcers, and the lesions can be very painful.¹⁵ Skin ulcers eventually form scabs, while oral ulcers remain exposed due to the moist environment.^{15,16} For the initial infection, the lesions will take approximately 2–3 weeks to resolve, but in cases of recurrence, the lesions will usually resolve

in about 5–10 days.¹⁸

HSV-1 typically manifests as orolabial lesions with most patients having rare outbreaks. Therefore, serologic testing for HSV-1 is not recommended by the Centers for Disease Control (CDC) or the United States Preventive Services Task Force (USPSTF).^{11,16} HSV-1 related genital infections have lower rates of symptomatic reactivations than HSV-2. Within the first year, approximately 20–50% of people with HSV-1 will have a symptomatic recurrence compared to >70% in patients with genital HSV-2 infections.¹⁸ Individuals with HSV-2 also will typically have more recurrences than those with HSV-1. The median number of symptomatic recurrences within the first year is 1.3 for HSV-1 and 4 for HSV-2.¹⁸ For both HSV-1 and HSV-2 genital herpes, recurrences tend to decrease in frequency over time, but many patients continue to experience them for over a decade.¹⁸

Patients with HSV infections should be educated about asymptomatic viral shedding and the attendant risks for transmission—which is highest during the first 12 months following initial infection—especially for those with HSV-2.¹⁶ Given the low risk for antiviral treatments for HSV, suppressive daily treatment is reasonable to not only reduce frequency and severity of outbreaks but also to reduce frequency of asymptomatic viral shedding. This consideration is especially relevant for patients in sexual relationships that are serodiscordant for HSV-2 (ie, partner is not infected with the same HSV serotype). Daily suppressive antiviral therapy, while helpful, may only decrease the risk of infecting a partner by about 50%.¹⁸ Most transmissions of HSV-2 are believed to occur when the infected person is asymptotically shedding the virus.^{18,19}

Overview of Testing

Either type of HSV can be diagnosed by either identification of the virus from lesions or by detection of serum antibodies (ie, serology).²⁰ Diagnostic testing has evolved over time from less reliable methods such as viral cultures and Tzanck preparations toward more modern serological testing and nucleic acid amplification tests (NAAT). Polymerase chain reaction (PCR) is the most commonly applied type of NAAT test.²¹ Importantly, despite common patient requests and clinician orders for HSV serologies, the USPSTF advises against routine serologic screening for HSV-1 and 2 infection in asymptomatic adolescents and adults, including pregnant individuals, due to the inaccuracy and cross-reactivity of these tests and the relatively clinically innocuous nature of HSV infections.¹¹

Viral Testing

For patients presenting with lesions, direct testing from lesions is recommended strongly over serological methods because serology cannot distinguish between active and past infections. Additionally, IgG serology testing will be negative in the weeks following an initial infection.¹⁶ Approaches to the direct testing of HSV lesions include viral culture and PCR. In viral culture, the sample is inoculated onto live cells in a laboratory that are observed for cytopathic effects.¹⁸ On the other hand, PCR detects the presence of viral DNA by amplifying genetic material from the sample.²² Both methods require proper sample collection techniques, which involve swabbing or “deroofing” a lesion.

To properly deroof and collect a sample, follow these steps:

1. Choose an unbroken vesicle that is filled with fluid.
2. Clean the area with sterile water or saline, avoiding alcohol or other skin disinfectants.
3. Use a sterile beveled hypodermic needle or a disposable scalpel to gently deroof the vesicle.
4. Collect the sample with the appropriate swab.
5. Place the swab in a viral transport medium and keep at 4°C and ensure arrival at the laboratory within 48 hours of collection.²²

Failure to adequately deroof a vesicle can lead to false negative PCR results. Unfortunately, the 2 largest laboratory services in the United States (Labcorp and Quest) do not provide in-depth descriptions of the vesicle swabbing technique.^{23,24}

PCR testing has become the preferred method for HSV DNA detection due to its higher sensitivity and faster turnaround time compared to viral culture.¹⁶ Viral culture also requires live viruses, increasing the probability of false negatives. PCR also can more reliably differentiate between HSV-1 and HSV-2 infections.²⁰

Serologic Testing

In patients without active lesions, serological testing is required if electing to pursue testing for HSV infection.¹⁶ Serologic tests detect antibodies in response to HSV infection, which gives information about the likelihood of past exposures. However, asymptomatic testing is only recommended in a narrow range of patients: those with either a known seropositive partner or those who have risk factors that predispose them to central nervous system or systemic infection.¹⁶

Serologic testing can be categorized into type-specific and type-common testing. Type-specific testing is a serologic assay diagnostic method that detects antibodies targeting specific types or strains of a pathogen. An ex-

ample of this is the Western blot assay, which is the gold standard for serologic testing, but has limited clinical availability.¹⁶ In contrast, type-common antibody testing identifies antibodies but is less specific for differentiating the responsible pathogen. Enzyme-linked immunosorbent assay (ELISA) is typically the type-common testing method when an IgG and immunoglobulin M (IgM) serologic test is ordered and is far more commonly clinically available.

Types of Immunoglobulins: IgM vs IgG

IgM is typically the first antibody produced by the immune system upon initial exposure to an infection. In the context of HSV, IgM antibodies can appear within 3-4 days after the primary infection.²⁵ However, IgM testing for HSV is rarely recommended due to significant limitations in its interpretability. First, IgM tests are considered type-common and cannot distinguish between HSV-1 and HSV-2 infections.¹⁶ IgM antibodies may also be detected during recurrent episodes or due to cross-reactivity with other herpesviruses, leading to possible misinterpretation. Finally, while IgM antibodies appear quickly, the levels also decline after a few weeks, further limiting any clinical utility of this assay in UC settings.²⁵

In contrast, IgG antibodies are produced more gradually and do not reliably appear until at least 2 weeks after infection. IgG antibodies remain detectable for years after an initial infection.²¹ It is this long-term persistence of IgG antibodies that allows for the identification of past infections, even in asymptomatic patients. Additionally, type-specific IgG tests are preferred, given that they can distinguish between HSV-1 and HSV-2 to certain degrees. This is achieved by targeting glycoproteins which are more specific to each virus type, however, cross-reactivity can also occur.¹⁸

ELISA vs Western Blot

ELISA is a widely used serological testing methodology used for detection of various antibodies to infectious agents and in cases of suspected autoimmune disease. While convenient and widely available, ELISA serology testing has important limitations. With regard to HSV testing specifically, multiple studies have shown that ELISA tests for HSV-2 can have high sensitivity but relatively low specificity, leading to false-positive results, especially in low-prevalence populations. Reported sensitivities for HSV-1 ELISA testing ranges from 69-99%, while specificities have been reported between 77-97.8%.^{26,27,28} HSV-2 results using ELISA have even lower accuracy with sensitivities around 92% and specificity

as low as 57.4%.²⁸ This means that many patients with HSV-1—the much more commonly encountered infection—will have false positive HSV-2 ELISA results. This underscores the importance of understanding and avoiding indiscriminate use of the HSV IgG serology among asymptomatic patients.

In Western blot assays, HSV-1 or HSV-2 viral proteins extracted from a patient sample are separated based on protein molecular weights using a technique called gel electrophoresis.²⁰ Western blot is considered the gold standard for HSV antibody detection and is used as the reference standard for determining sensitivity and specificity of other tests.^{26,28,29} Due to its higher specificity than ELISA IgG testing, Western blot is recommended for confirming ambiguous or low-titer level “positive” ELISA results, especially for HSV-2. However, HSV Western blot is not commercially available in the United States, and testing is only available through specialized laboratories. As of this publication, for example, the HSV-2 Western blot test is only available through a private laboratory at the University of Washington.³⁰

Overall, it is important that patients are aware of the limitations of serological testing with ELISA, most notably the risk for false positives, especially with low index values. A 2016 review of 17 studies indicated that serologic screening tests for HSV-2 showed a false-positive rate of 50% in populations with similar prevalence to U.S. adults. The review article also found that these false positive results can contribute to depression and anxiety among affected individuals.¹² Confirmatory testing with Western blot is therefore recommended in cases with positive HSV-2 titers. Given the potential lifelong implications, this recommendation makes sense but is likely to be practically challenging given limited access to Western blot (ie, the recommended confirmatory test). Additionally, comprehensive counseling is recommended after a positive test result is returned.¹⁶ Western blot results may require many weeks to return. However, patients can be educated to return to the clinic if they develop lesions, which can be tested by viral PCR swab as previously discussed.²¹ This complexity in possible testing outcomes and need for potentially extensive counseling underscores the importance of conscientiously approaching HSV serology testing requests, especially from time- and resource-limited UC centers.

Recommendations For Testing

The CDC and the European Centre for Disease Prevention and Control (ECDC) have similar guidelines for HSV serologic testing.^{10,16}

Viral testing for HSV-2 is recommended over serologic

testing when lesions are present.¹⁶

In 2017, more comprehensive HSV testing guidelines were published in the *International Journal of STD and AIDS*.¹⁰ These authors suggest that NAAT laboratory confirmation (via lesion swabbing) is advised in suspected cases of HSV, regardless of whether the clinical suspicion is high or low. If it is a first suspected outbreak of HSV, swabbing for PCR allows for determination whether the outbreak is related to HSV or another cause and can also distinguish between HSV-1 and HSV-2. Routine serologic testing is discouraged due to the low accuracy of these tests and significant psychosocial consequences of inaccurate results. For these reasons, HSV type-specific serology is only recommended for certain groups and situations, and with low-level evidence (IV, C).¹⁰ A detailed discussion of these specific groups and situations is outside of the scope of this article.

“NAATs can detect HSV from genital ulcers or other mucocutaneous lesions.”

The USPSTF similarly recommends against routine asymptomatic serologic testing for HSV in adults and adolescents, regardless of pregnancy status.³¹ However, they do make note that serological testing is appropriate for individuals who are in sexual relationships with a partner known to have HSV infection to determine if the pair are serodiscordant.³¹

The CDC guidelines also advocate for type-specific HSV-2 serologic testing in patients who are (or are believed to be) serodiscordant from their partner. The CDC also recommends that, if collecting an HSV viral swab, a serologic test for syphilis should also be collected because lesions from HSV and syphilis may mimic one another and clinically distinguishing them is not reliable.²¹

Patients Presenting With Lesions

As previously discussed, NAAT/PCR is recommended in patients presenting with genital or orolabial lesions. NAATs can detect HSV from genital ulcers or other mucocutaneous lesions.

Fortunately, viral NAAT testing has become increasingly available over recent years.¹⁶ NAAT testing with proper technique is highly sensitive (90.9-100%) and nearly 100% specific.¹⁶

Viral culture is no longer recommended unless no

other testing is available because it requires more time and has lower sensitivity.^{16,20} Serum HSV PCR tests are not recommended to diagnose genital herpes infection unless there is a concern about disseminated infection or visceral involvement (eg, hepatitis).¹⁶

“Routine HSV-1 and/or 2 serology should not be included in testing for patients presenting for routine STI screening.”

Patients Presenting Without Lesions

Given that HSV is a chronic infection without active lesions present most of the time, patients can commonly present requesting HSV testing while asymptomatic. In such patients, a thorough understanding of the characteristics of serologic testing modalities is crucial. Given the nuances previously discussed, it is unsurprising that both clinicians and patients are commonly confused about the interpretation of serologic testing for HSV.²⁰

Serology testing can include ELISA and Western blot, however, only ELISA is commercially available at this time in the United States. These tests work by detecting HSV glycoproteins or HSV-specific antibodies.²⁰ Older serologic testing methods for IgG and IgM antibodies are less reliable than ELISA and rely on highly cross-reactive whole-virus antigens and therefore are not recommended for use.¹⁸

IgM serology testing is not recommended because it is a type-common test that cannot differentiate between HSV-1 and HSV-2 and IgM antibodies are not enduring in the same way IgG antibodies persist. Furthermore, HSV IgG serologic testing is also discouraged except in specific situations (eg, serodiscordant couples) due to its poor ability to distinguish between HSV-1 and 2 infections and the site of infection. HSV-2 cross reactivity in patients with HSV-1 infection (ie, false positives) is a common phenomenon, and Western blot confirmatory testing is largely inaccessible. Therefore, given potential psychological or social harms to patients and need for extensive counseling, it is sensible to explain to patients the hazards of HSV serology testing and defer the testing

to clinics specializing in sexually transmitted infections.¹⁶

In addition to the CDC, the USPSTF, the American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists (ACOG) also provide recommendations regarding HSV testing. The USPSTF, AAFP, and ACOG all agree that routine HSV testing in asymptomatic individuals should not be performed. Patients can also be referred to the respective guidelines to facilitate discussions with their romantic partner(s).

Takeaway Points

- PCR/NAAT testing is recommended in patients with lesions that could represent HSV infection. These tests have good sensitivity and are very specific for each HSV subtype. Lesions must be unroofed before obtaining a PCR swab for the test to be accurate.
- Routine HSV-1 and/or 2 serology should not be included in testing for patients presenting for routine STI screening. IgM serology is not recommended in any scenario, and IgG testing should only be performed in specific scenarios of high risk and after appropriate counseling.
- Any time an HSV viral lesion swab is collected, a serologic syphilis test is also recommended because clinically distinguishing HSV from syphilis is otherwise not reliable.
- HSV-2 serology is reasonable in patients with concerns for serodiscordance in their romantic relationships. Patients in high-risk relationships should be educated on transmission risk and asymptomatic viral shedding. ■

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References

1. Gustavsson E, Grünewald K, Elias PE, Hällberg BM. Dynamics of the Herpes simplex virus DNA polymerase holoenzyme during DNA synthesis and proof-reading revealed by Cryo-EM. *Nucleic Acids Res.* 2024; gkae374. doi:10.1093/nar/gkae374.
2. International Committee on Taxonomy of Viruses (ICTV). Virus taxonomy: 2020 release. Published 2024. Accessed March 24, 2024. Available from: <https://ictv.global/taxonomy/>
3. Bharucha T, Houlihan CF, Breuer J. Herpesvirus infections of the central nervous system. *Semin Neurol.* 2019;39(3):369-382. doi:10.1055/s-0039-1687837.
4. James C, Harfouche M, Welton NJ, et al. Herpes simplex virus: global infection prevalence and incidence estimates, 2016. *Bull World Health Organ.* 2020;98(5):315-329. doi:10.2471/BLT.19.237149.
5. Harfouche M, AlMukdad S, Alareeki A, et al. Estimated global and regional incidence and prevalence of herpes simplex virus infections and genital ulcer disease in 2020: mathematical modelling analyses. *Sex Transm Infect.* Published online December 10, 2024. doi:10.1136/sextrans-2024-056307.
6. National Center for Health Statistics (NHANES). 2015-2016 Overview. Accessed from: <https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/overview.aspx?BeginYear=2015>.
7. Crawford KHD, Selke S, Pepper G, et al. Performance characteristics of highly automated HSV-1 and HSV-2 IgG testing. *J Clin Microbiol.* 2024;62:e00263-24. doi:10.1128/jcm.00263-24.

8. Wang C, Xu Y, Zhang X, et al. Advances in herpes simplex virus diagnostics: from laboratory to point-of-care testing. *Front Microbiol.* 2023;14:1123456. doi:10.3389/fmicb.2023.1123456.
9. You S, Yaesoubi R, Lee K, et al. Lifetime quality-adjusted life years lost due to genital herpes acquired in the United States in 2018: a mathematical modeling study. *Lancet Reg Health Am.* 2023;19:100427. doi:10.1016/j.lana.2023.100427.
10. Patel R, Kennedy OJ, Clarke E, et al. 2017 European guidelines for the management of genital herpes. *Int J STD AIDS.* 2017;28(14):1366-1379. doi:10.1177/0956462417727194.
11. Asher G, Feltner C, Harrison W, et al. Serological screening for genital herpes: a reaffirmation evidence update for the U.S. Preventive Services Task Force. *Evid Synth No.* 224. Agency for Healthcare Research and Quality; 2023. AHRQ Publication No. 22-05296-EF-1.
12. Feltner C, Grodensky C, Ebel C, et al. Serological screening for genital herpes: an evidence review for the U.S. Preventive Services Task Force. Rockville, MD: Agency for Healthcare Research and Quality (US); 2016 Dec. (Evidence Syntheses, No. 149.)
13. Freeman EE, Weiss HA, Glynn JR, et al. Herpes simplex virus 2 infection increases HIV acquisition in men and women: systematic review and meta-analysis of longitudinal studies. *AIDS.* 2006;20(1):73-83.
14. Looker KJ, Welton NJ, Sabin KM, et al. Global and regional estimates of the contribution of herpes simplex virus type 2 infection to HIV incidence: a population attributable fraction analysis using published epidemiological data. *Lancet Infect Dis.* 2020;20(2):240-249.
15. Kimberlin DW, Rouse DJ. Genital herpes. *N Engl J Med.* 2004;350(19):1970-1977.
16. Workowski KA, et al. Sexually transmitted infections treatment guidelines, 2021. Accessed from: <https://www.cdc.gov/std/treatment-guidelines/default.htm>.
17. Falk-Hanson E, Marconi A, Sarrouf EB, Sullivan P. Herpes Simplex Type 1 as the Predominant Cause of Genital Herpes in College Students. *Sex Transm Dis.* 2024;51(12):784-787. doi:10.1097/OLQ.0000000000002060. Epub 2024 Aug 8. PMID: 39102507.
18. Gnann JW Jr, Whitley RJ. Genital herpes. *N Engl J Med.* 2016;375(7):666-674.
19. Schiffer JT, Mayer BT, Fong Y, Swan DA, Wald A. Herpes simplex virus-2 transmission probability estimates based on quantity of viral shedding. *J R Soc Interface.* 2014;11(95):20140160. doi:10.1098/rsif.2014.0160.
20. Nath P, Kabir MA, Doust SK, Ray A. Diagnosis of herpes simplex virus: laboratory and point-of-care techniques. *Infect Dis Rep.* 2021;13(2):518-539. doi:10.3390/idr13020049.
21. Miller JM, Binnicker MJ, Campbell S, et al. A guide to utilization of the microbiology laboratory for diagnosis of infectious diseases: 2018 update. *Clin Infect Dis.* 2018;67(6):e1-e94. doi:10.1093/cid/ciy381.
22. Singh A, Preiksaitis J, Ferenczy A, Romanowski B. The laboratory diagnosis of herpes simplex virus infections. *Can J Infect Dis Med Microbiol.* 2005;16(2):92-98. doi:10.1155/2005/318294. PMID: 18159535; PMCID: PMC2095011.
23. Labcorp. Herpes simplex virus (HSV) types 1 and 2, NAA. Labcorp website. <https://www.labcorp.com/tests/188056/herpes-simplex-virus-hsv-types-1-and-2-naa>. Accessed March 10, 2025.
24. Quest Diagnostics. SureSwab Herpes Simplex Virus Type 1 and 2, mRNA, TMA. Quest Diagnostics website. <https://testdirectory.questdiagnostics.com/test/test-detail/90570/sureswab-herpes-simplex-virus-type-1-and-2-mrna?cc=MASTER>. Accessed March 10, 2025.
25. Hsueh PR, Huang LM, Chen PJ, Kao CL, Yang PC. *Clin Microbiol Infect.* 2004;10(12):1062-1066. doi:10.1111/j.1469-0691.2004.01009.x.
26. Mark HD, Nanda JP, Roberts J, et al. Performance of Focus ELISA tests for HSV-1 and HSV-2 antibodies among university students with no history of genital herpes. *Sex Transm Dis.* 2007;34(9):681-685. PMCID: PMC2648390.
27. Ashley-Morrow R, Nollkamper J, Robinson NJ, Bishop N, Smith J. Performance of Focus ELISA tests for herpes simplex virus type 1 (HSV-1) and HSV-2 antibodies among women in ten diverse geographical locations. *Clin Microbiol Infect.* 2004;10(6):530-536. PMID: 15191381.
28. Agyemang E, Le QA, Warren T, et al. Performance of commercial enzyme-linked immunoassays for diagnosis of herpes simplex virus-1 and herpes simplex virus-2 infection in a clinical setting. *Sex Transm Dis.* 2017;44(12):763-767.
29. Martins TB, Welch RJ, Hill HR, Litwin CM. Comparison of a multiplexed herpes simplex virus type-specific immunoglobulin G serology assay to immunoblot, Western blot, and enzyme-linked immunosorbent assays. *Clin Vaccine Immunol.* 2009;16(1):55-60. PMCID: PMC2620677.
30. Hussein A. Analyzing trends in HSV Western Blot results at a reference laboratory. Published 2021. Accessed from: <https://digital.lib.washington.edu/researchworks/handle/1773/47495>.
31. US Preventive Services Task Force, Mangione CM, Barry MJ, et al. Serologic Screening for Genital Herpes Infection: US Preventive Services Task Force Reaffirmation Recommendation Statement. *JAMA.* 2023;329(6):502-507. doi:10.1001/jama.2023.0057

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The 2025 Urgent Care Top 100

By Number of Locations

Alan Ayers, MBA, MAcc

The following table summarizes the 100 largest urgent care operators by number of locations as of April 1, 2025, based on data provided by National Urgent Care Realty and Urgent Care Consultants.

Because of the significant number of private operators that also operate facilities with hospital partners, the list delineates health-system-affiliated locations. Duplication is avoided by placing joint venture centers under the operating partner. Data is reported by the parent entity as opposed to regional brands, partnerships, or affiliations.

Of the nation's 14,442 urgent care centers, 5,722 (40%) are operated by a top 100 entity. Additionally, 56% of the locations in the Urgent Care Top 100 par-

ticipate in a hospital affiliation, compared to 40% of all centers.

A hospital affiliation may include majority or minority equity joint ventures, management-only contracts, clinical network integration, branding or cobranding agreements, or other engagement that is marketed to the public. To avoid duplication, affiliated centers are reported under the "private" entity, separate from centers operated by the health system directly.

Because there are several ties in the rankings—multiple operators with an equal number of locations—the total number of operators in the Urgent Care Top 100 this year is 101.■

Ranking	Corporate Entity	Total	Hospital Affiliated	Comments
1	American Family Care	403	17	Includes health system franchisees
2	HCA Healthcare	333	333	
3	GoHealth Urgent Care	307	307	Includes hospital joint venture and affiliated centers; excludes MedExpress locations
4	Fast Pace Health	301		
5	CityMD Urgent Care	190		
6	WellNow Urgent Care	165	24	Includes hospital joint venture and affiliated centers
7	NextCare Urgent Care	145	41	Includes hospital joint venture and affiliated centers
8	Advocate Health	119	119	
9	Community Care Partners	107		
9	University of Pittsburgh Medical Center	107	107	Includes MedExpress locations
11	WellStreet Urgent Care	102	102	Includes hospital joint venture and affiliated centers
12	Carbon Health Urgent Care	96		
13	CRH Healthcare	95	78	Includes hospital joint venture and affiliated centers
14	PM Pediatrics	85	15	Includes hospital joint venture and affiliated centers
14	Urgent Team	85	67	Includes hospital joint venture and affiliated centers
16	CommonSpirit Health	82	82	
17	Patient First	79		
18	Providence Health & Services	74	74	
19	Premier Health	68	68	Includes hospital joint venture and affiliated centers
19	Xpress Wellness	68		

Author Affiliations: Alan Ayers, MBA, MAcc, is president of Experity Consulting and Senior Editor of JUCM.

Ranking	Corporate Entity	Total	Hospital Affiliated	Comments
19	Sanford Health	68	68	
22	Bon Secours Mercy Health	65	65	Excludes American Family Care locations
23	Access Medical Clinic	63		
24	Novant Health	62	62	Excludes GoHealth locations
25	Trinity Health	61	61	Excludes WellNow and Premier Health locations
25	Exer - More Than Urgent Care	61		
25	MainStreet Family Urgent Care	61		
28	UrgentCare Group	59	11	Includes hospital joint venture and affiliated centers
29	AdventHealth Centra Care	57	57	
30	Midwest Express Clinic	53		
31	FastMed Urgent Care	52		
31	MultiCare Health System	52	52	
33	Banner Health	48	48	
34	CareSpot Urgent Care	46	34	Includes hospital joint venture and affiliated centers
34	Community Health Systems	46	46	
34	Next Level Urgent Care	46		
37	ConvenientMD	45		
38	Ardent Health Services	43	43	
39	CareFirst Urgent Care	42		
39	Cleveland Clinic	42	42	
39	Rock Oak Capital	42		
42	OSF HealthCare	41	41	Excludes WellNow locations
43	AllCare Family Medicine & Urgent Care	40		
43	Sutter Health	40	40	
45	Endeavor Health	39	39	
46	PeaceHealth ZoomCare	38	38	
46	Intermountain Health	38	38	
46	My Dr Now	38		
49	Ascension Health	36	36	Excludes UrgentTeam locations
50	Ochsner Rush Health	35	35	
50	UNC Health Care	35	35	
52	UnityPoint	34	34	
52	Hometown Urgent Care & Occupational Health	34		
54	MedStar Health	33	33	
55	Atlantic Health System	32	32	
55	SSM Health	32	32	
57	Emergence Health Holdings	31	4	Includes hospital joint venture and affiliated centers
58	Texas Health Breeze Urgent Care	30	30	
59	Doctor's Urgent Care Group	29		
59	ExpressCare Urgent Care	29	29	
59	Yale New Haven Health	29	29	

Ranking	Corporate Entity	Total	Hospital Affiliated	Comments
62	Perlman Clinic	28		
63	Geisinger Health	27	27	
63	Baptist Health South Florida	27	27	
63	Med First Urgent Care & Family Practice	27		
63	Northwestern Medicine	27	27	
67	Corewell Health	26	26	
67	HonorHealth	26	26	
67	Jefferson Health	26	26	
67	Norton Healthcare	26	26	
67	Sentara Health	26	26	
67	University of Colorado Health	26	26	
73	Adventist Health	25	25	
73	BaylorScott&White	25	25	Excludes NextCare locations
73	MedRite Urgent Care	25		
73	St. Luke's University Health Network	25	25	
77	Baptist Health Kentucky	24	24	
77	Excel Urgent Care	24	1	Includes hospital joint venture and affiliated centers
77	Walk In Urgent Care Ohio	24		
80	Urgent Care for Kids	23		
81	CareConnect Health	22		
81	Mass General Brigham	22	22	
81	WellStar Health System	22	22	
84	HealthPartners	21	21	
84	University of Kansas Health System	21	21	
84	LifePoint Health	21	21	
84	Maxem Health Urgent Care	21		
84	Sterling Urgent Care	21		
84	Tampa General Hospital	21	21	
90	Aspirus Health	20	20	
90	Essentia Health	20	20	
92	Allina Health	19	19	
92	BayCare Health System	19	19	
92	BJC HealthCare	19	19	
92	Hackensack Meridian Health	19	19	
92	Little Spurs Pediatric Urgent Care	19		
97	Avera Health	18	18	
97	CHRISTUS Health	18	18	
97	Docs Urgent Care	18		
97	OhioHealth	18	18	
97	Vanderbilt Health	18	18	



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ABSTRACTS IN URGENT CARE

Can Doctors Predict Patient Outcome from a First Impression?

Take Home Point: In this systematic review, the first impressions of “sick versus not sick” and appropriate patient disposition had reasonable predictive value for patient outcomes but was not sufficiently accurate to supplant thorough clinical assessment.

Citation: Treloar E, Abraham A, Smith E, et. al. Can first impressions predict patient outcomes? *Acad Emerg Med*. 2025 Mar;32(3):351-354. doi: 10.1111/acem.15053.

Relevance: In busy environments such as urgent care (UC) centers and emergency departments (EDs), quickly identifying patients needing more immediate attention is a critical skill required for appropriate triage.

Study Summary: This was a systematic review of studies conducted among emergency physicians assessing the accuracy of clinical first impressions to predict patients' outcomes. Three main databases, Medline, Embase and PSYCHINFO were searched using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) reporting guidelines. The authors focused on morbidity, mortality, complications, readmissions, length of stay (LOS), and disposition outcomes.

The authors identified 9 suitable studies, involving 7,815 first impressions assessments of 7,539 patients. Seven of the 9 studies were ED based. The authors found that there was low physician accuracy in determining overall in-hospital mortality (32.8%), however, first impression of “looking ill” was associated with significant mortality ($p < 0.001$) and acute morbidity ($p < 0.001$). When comparing patient's perception of illness, patients predicted the severity of their own illness with better sensitivity than physicians (78% vs 47%) but lesser specificity (49% vs 86%). Somewhat surprisingly, attending physicians did not significantly outperform residents. Among predictions of disposition, physicians across studies had the greatest specificity in

predicting patients requiring intensive care unit admission (Sp 87-95%), but relatively poor sensitivity.

Editor's Comments:

The psychologist Daniel Kahneman outlined his work defining the 2 systems of cognitive processing in his book “Thinking Fast and Slow.” System 1, the “thinking fast” system, is responsible for snap judgments and often considered synonymous to intuition. Interestingly, clinical experience did not significantly affect intuition in this systematic review, which contradicts research in other disciplines. Importantly, the findings of this study suggest that physician first impressions are not without value, but are not sufficient alone to adequately predict patient outcomes. It will be interesting, as artificial intelligence (AI) is increasingly implemented, to determine how clinician judgment can be augmented. Until such tools are available, it is important to utilize both the fast system involved in developing a first impression, but also system 2 (ie, the “slow system”) to ensure adequate patient assessment. ■

How Reliable is Urine Dipstick for the Assessment of Febrile Infants?

Take Home Point: In this multicenter pediatric ED-based study, negative urine dipstick results, defined as absence of both leukocyte esterase (LE) and nitrites, had reasonable sensitivity for excluding urinary tract infection (UTI) in infants when measured with a catharized specimen.

Citation: Hunt K, Green R, Sartori L, et al. Urine Dipstick for the Diagnosis of Urinary Tract Infection in Febrile Infants Aged 2 to 6 Months. *Pediatrics*. 2025;155(4):e2024068671

Relevance: Fever is among the most common presenting symptoms in infants, with UTI being among the common diagnostic considerations. UC centers often have access to only qualitative urine dipstick testing. Given the potential long-term impact of renal scarring if UTIs are missed in young children, understanding the reliability of urine dipstick testing is of significant clinical utility.

Study Summary: This was a cross-sectional study, of infants aged 2-6 months presenting to 5 pediatric EDs in



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the United States from 2011-19 with fever. Eligible patients had a catheterized urine culture obtained and a temperature $\geq 38^{\circ}\text{C}$ that was recorded at any point during the ED visit by any route. Children with congenital and chronic conditions were excluded. The authors defined a positive urine dipstick as any positive leukocyte esterase ($\geq 1+$ or small) and/or any positive nitrite. The primary outcome was the final diagnosis of UTI defined by a urine culture growing $\geq 50,000$ CFUs/mL of a single bacterial pathogen.

Of the initial group of 21,150 febrile infants recruited for the initial study, 9,387 (44.4%) had a urine culture obtained. The authors found that 7,738 (82.4%) of these patients also had a urine dipstick performed. Additionally, 1,044 infants (11.1%) had a UTI as defined by confirmation on urine culture.

Infants with UTIs were older on average (>90 days of age: ~65% in the UTI group vs 39% in the non-UTI group), more likely to be female (64% vs 48%), and had higher peak temperatures ($>39^{\circ}\text{C}$: 51% in UTI group vs 35% in the non-UTI group). The authors also found that combining nitrite and leukocyte esterase positivity optimized sensitivity and specificity of the dipstick. Positive urine dipsticks had a higher sensitivity (90.2%, 95% confidence interval [CI] 88.1%–92.1%; difference 6.4%, 95% CI 3.8%–8.9%) and specificity (92.6%, 95% CI 91.9%–93.2%; difference 5.6%, 95% CI 4.7%–6.6%). Ninety patients (1.4%) had negative urine dipsticks and ultimately were diagnosed with UTI (ie, had a positive urine culture). Of all findings on dipstick, nitrites were most specific for UTI (98.9%).

Editor's Comments: There was potential for selection bias in the study as only patients with a urine culture were included. Clinicians' decisions about sending urine for culture were likely influenced by the results of urine dipstick, which may overestimate sensitivity. Perhaps most importantly, all samples were from catheterized specimens. This assumption also limits the generalizability to UC centers as many centers do not have the equipment or appropriately trained staff to collect catheterized urine specimens in infants. Use of techniques to facilitate clean urine collection (eg, sacral massage) may be a reasonable surrogate for catheterized specimen and certainly less likely to be contaminated than bag urine collection. Prospective studies of febrile infants in UC settings would be helpful for clarifying if a fully negative urine dipstick is sufficient to exclude UTI. Until that time, clinicians are best served making individualized assessments and engaging in shared decision-making with parents about ED referrals or empiric antibiotics while awaiting culture results. The patternicity of UTIs being associated more commonly with older age, female sex, and higher temperature measure-

ments can be considered in these nuanced clinical decision-making situations. ■

Can Virtual Reality Effectively Distract Children to Facilitate Laceration Repair?

Take Home Point: Virtual reality (VR) goggle use may be slightly superior for reducing pain and anxiety associated with laceration repair in school-aged children. The vast majority of children and parents reported a positive experience associated with the use of the VR headset.

Citation: McEvoy A, Vincent O, Vazifedan T, et. al. Virtual Reality as Active Distraction in Laceration Repair: A Game Changer? *Pediatr Emerg Care*. 2025 Mar 1;41(3):208-212. doi: 10.1097/PEC.0000000000003319.

Relevance: Procedures such as laceration repair elicit anxiety, which can amplify pain response in children. Finding new and novel techniques that have a calming effect allows UC clinicians to perform such procedures in UCs, which negates the need for transfers to ED, and provides better quality of service for patients and parents.

Study Summary: This was an unblinded, randomized control trial utilizing VR goggles as an active distraction technique for simple laceration repair compared to standard care (SC) a pediatric ED. The intervention group used Lenovo Mirage goggles (Beijing, China) with Daydream and the game Pebbles the Penguin (Stanford Chariot Program, Palo Alto, CA). The SC was given other distraction methods such as normal screen time and parental involvement. All children received appropriate anxiolytics, topical and/or local anesthetic as determined suitable by the clinical team. Main outcomes were pain and fear scores collected as measured by the Wong-Baker Faces Pain Scale (WBFPS) and Children's Fear Scale (CFS). Parents-guardians were able to help the children complete the scores after completing a survey themselves.

Ninety-one children aged 6-17 years were enrolled into the study. The authors found children using VR had significantly lower mean pain scores (2.3 vs 3.7), mean fear scores (2.2 vs 3.0), and lower risk of requiring anxiolytic medication (OR=0.27, P=0.006). Of those randomized to the VR group, 98% of parents and 94% of patients noted that they would use the VR goggles again.

Editor's Comments: Distraction techniques for painful proce-

dures are of particular importance in UC settings where rapid disposition is a priority and where anxiolytic medications are rarely available. While offering screentime on a parent's phone is effective for many younger children, this has limited utility in school aged children such as those included in this study. It's worth noting, however, that while the differences in pain and fear scores were statistically significant, they differed by only 1.4 and 0.8 absolute points respectively, suggesting less than dramatic clinical significance. UC centers will have to balance costs and the hassle-factor of ensuring an additional piece of technology (ie, the VR headset) is clean, charged, and operational against a real, but likely small, benefit for a select group of children undergoing potentially painful procedures. ■

Outcomes and Injury Patterns in Elderly Patients After Falls

Take Home Point: A small minority of patients aged over 65 years in this study were found to have injuries requiring intensive care unit (ICU) admission following ground-level fall (GLF).

Citation: Kan V, Huang W, Seitgauf-Regan G, et. al. Injuries and Outcomes of Ground-level Falls Among Older Patients: A Retrospective Cohort Study. *West J Emerg Med.* 2025 Mar;26(2):301-306. doi: 10.5811/westjem.35281.

Relevance: GLFs are particularly common in elderly patients (>65 years). When presenting to EDs after such falls, whole-body computed tomography (CT) is commonly standard practice in many trauma centers. Whole body CT is associated with significant cost and risks—including exposure to ionizing radiation, contrast reactions, and the discovery of incidental findings that often require additional invasive and unnecessary testing with further associated risks.

Study Summary: This was a retrospective cohort study of patients presenting to a tertiary Level 1 trauma ED in Massachusetts. The authors included all patients >65 years and older patients who presented to the ED during a one-year period and underwent whole-body CT imaging (ie, CT of the head, total spine, chest, abdomen, and pelvis). Primary outcomes were the rate of significant injuries diagnosed. Significant injuries were defined as clinically significant intra-thoracic or intra-abdominal injuries, intracranial hemorrhage (ICH), and spinal fractures. ICU admission rates and all-cause, in-hospital, mortality were also included as primary outcomes. The secondary analyses were associations between age, injury types, and outcomes.

The mean age of the 638 patients included was 82 years, and 60% were women. Among them, 63% of patients were taking at least one antiplatelet or anticoagulant medication. Additionally, 120 patients (18.9%) were found to have a significant thoracic injury, 80 (12.5%) sustained ICH, 60 patients (10%) sustained thoracic spine injuries, and 51 patients (8%) sustained lumbar spine injuries. Cervical spine fractures were the most rare spinal segment injured occurring in only 5.3% of patients. Only 5 patients (0.8%) sustained an intra-abdominal injury. All those with intra-abdominal injuries had clinical features suggestive of serious pathology including hypotension, tachycardia, and severe pain/abdominal tenderness. In the study, 134 (21.0%) patients were admitted to the ICU, and 31 (4.8%) died during their index hospitalization. There was no association between increasing age and ICU admissions or in-hospital, all-cause mortality rate.

Editor's Comments: The retrospective design and inclusion criteria only captured patients who had whole-body CT scans. There may have been patients who were not scanned selectively for various reasons. This study, therefore, cannot be used to guide which patients may benefit from whole-body CT, rather it can only state that among elderly patients who underwent whole-body CT after GLF, many of the scans offered little insight in diagnosing injuries that would otherwise be missed. The cause of fall was also not reported, and it is possible that patients, for example, fell because of a spontaneous ICH rather than suffered a traumatic ICH. What is perhaps most noteworthy is that age was not predictive of ICU admission rates or in-hospital mortality. This suggests that chronologic age is less material than “physiologic age” (ie, frailty) and serious injuries related to simple GLFs, as has been identified for years with hip fractures, is a strong indicator of a high-risk for short-term mortality. Patients with repeat falls and/or significant injuries sustained from GLFs that do not require ED-level care should be viewed by UC clinicians as opportunities to warn patients and families of the ominous nature of this clinical phenomenon.

Preventing Recurrence of Bacterial Vaginosis by Treating Male Partners

Take Home Point: Treating the male partners of women with bacterial vaginosis (BV) resulted in dramatically lower rates of recurrence over the subsequent 12 weeks when compared to treatment of the female patient alone.

Citation: Vodstrcil L, Plummer E, Fairley C, et. al. Male-Partner Treatment to Prevent Recurrence of Bacterial Vaginosis. *N Engl J Med.* 2025 Mar 6;392(10):947-957. doi: 10.1056/NEJMoa2405404.

Relevance: BV is very commonly seen in UC and, in a frustratingly high proportion of cases, is a recurrent issue for many women. Oral and vaginal treatments are generally considered equally effective, however, recurrence has been reported to occur in greater than 50% of cases. It is understood that BV, while not considered a sexually transmitted infection in the same sense as gonorrhea or chlamydia, recurs more frequently in patients who are sexually active and in those with higher numbers of partners.

Study Summary: This was an open-label, randomized, controlled trial of heterosexual couples where the woman was diagnosed with BV across 5 outpatient sexual health centers in Australia. Pre-screened perimenopausal women with suggestive symptoms who also met the diagnostic criteria for the condition (presence of at least 3 of 4 Amsel criteria and a Nugent score of 4 to 10), with a stable male partner were included. Couples were randomized in a 1:1 ratio to either partner-treatment group (PTG) (treatment of the woman and her male partner) or the control group (CG) (treatment of the woman only). Treatment regimens in the experimental group were metronidazole 400mg tablets twice daily, or intravaginal 2% clindamycin cream for one week, or intravaginal 0.75% metronidazole gel for five nights for the women. Male partners received metronidazole 400mg tablets and were instructed to apply 2% clindamycin cream topically to the glans penis and upper shaft and under the foreskin (if the male partner was uncircumcised) twice daily for 7 days. No placebo cream was used for the control group to eliminate the potential for changes in the penile microbiome. The primary outcome was the recurrence of BV within 12 weeks.

The authors enrolled 164 couples; 81 were assigned to the PTG and 83 to the CG. The authors found that BV recurred in 24 of 69 women (35%) in the PTG (recurrence rate, 1.6 per person-year; 95% CI, 1.1 to 2.4) and in 43 of 68 women (63%) in the CG (recurrence rate, 4.2 per person-year; 95% CI, 3.2 to 5.7). The study was stopped early for ethical reasons based on the large difference favoring the treatment group. The difference found corresponds to an absolute risk difference of -2.6 recurrences per person-year (95% CI, -4.0 to -1.2) and a lower risk of recurrence among women in the PTG than among those in the CG over 12 weeks (hazard ratio, 0.37; 95% CI, 0.22 to 0.61). All the female participants took at least 70% of their prescribed medication while among male participants, 8 of

56 (14%) reported taking less than 70% of doses of prescribed medications. Sensitivity analyses showed that the lowest recurrence rates were found among partners of men completely adherent to treatment.

Editor's Comments: This study is overdue. It's clear that BV goes beyond the female partner. Given the dramatic treatment effect, it is very likely that attention to the male partner is an important factor in prevention of BV recurrence. This raises a number of questions that will be difficult to assess given heterogeneity in sexual practices and challenges in measuring sexual contact frequency and types reliably. Given the anatomical differences in male and female genitalia, it seems likely that men's risk of genital dysbiosis would be affected less dramatically than women's by oral antibiotics. It is unfortunate that the authors did not include a treatment arm where men were treated only with topical antibiotics (or even one with simple use of skin disinfectant soap, such as chlorhexidine, rather than cream). While not highly common, oral metronidazole is associated with potential significant adverse reactions, which may influence partner adherence. Whether these results in this small study are dramatic enough to influence treatment guidelines remains to be seen in time. However, it seems reasonable to implement discussing the importance of male partner genital hygiene immediately when faced with the frequent UC scenario of a female patient presenting with frustrations about recurrent BV. ■

Guidance for Antibiotics Prophylaxis Across an Array of Injuries

Take Home Point: These recommendations are based more on expert opinion than evidence. They do, however, offer some guidance that UC clinicians can use to justify clinical decisions regarding the use or avoidance of prophylactic antibiotics in a variety of wound related presentations. Specific situations that contravene prior, non-evidence-based use of antibiotics include, most notably, when using nasal packing for traumatic epistaxis.

Citation: Appelbaum R, Farrell M, Gelbard R, et al. Antibiotic Prophylaxis In Injury: An American Association For The Surgery Of Trauma Critical Care Committee Clinical Consensus Document. *Trauma Surg Acute Care Open.* 2024;9: e001304.

Relevance: Selective use of antibiotics with attention to

stewardship requirements are needed not only in patients presenting with illness, but also those who attend the UC with injuries.

Study Summary: This was a clinical consensus document compiled by the American Association for the Surgery of Trauma Critical Care Committee with aims to provide practical guidance on the best practices in the assessment and antibiotic prophylaxis for adult patients presenting with injuries. When choosing an antibiotic regimen, consideration for special circumstances regarding degree and type of contamination, salt water/freshwater, possibility of clostridial species, and/or mammal or human bites. The authors acknowledge that there is a large variability in the practice of using prophylactic antibiotics which results in overuse of antibiotics in aggregate among this patient population.

A summary of the areas commonly pertinent in UC practice are below.

Prophylactic antibiotics are suggested for:

- Through-and-through lacerations from the skin to the oral cavity and in the setting of mammalian bites to the face

Prophylactic antibiotics should not be routinely prescribed for:

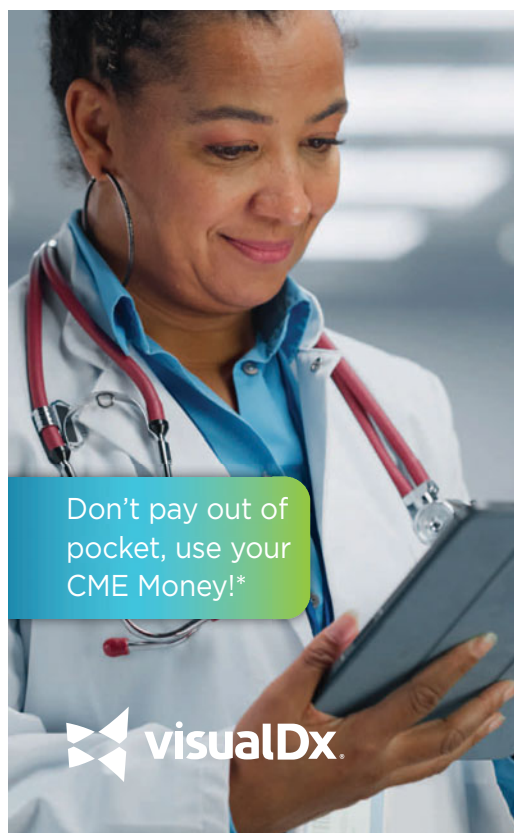
- Simple facial and scalp lacerations
- Closed, non-operative orbital, upper face, mid-face,

or mandibular fractures

- Nasal packing for traumatic epistaxis
- Simple soft tissue lacerations
- Simple stab wounds that involve only soft tissue
- Burn patients

In addition, open extremity fractures should be graded based on the Gustilo classification system and treated with antibiotics based on the fracture severity.

Editor's Comments: The intended audience for this document was hospital-based clinicians, such as intensivists and surgeons. Many recommendations are germane to UC presentations, however, and since UC patients with traumatic presentations may be following up with specialists, it is prudent for UC clinicians to familiarize themselves with guidelines they are likely to reference to determine appropriateness of care. Common practice (ie, treatment bias) among clinicians providing episodic care favors overuse of prophylactic antibiotics. This indiscriminate use likely results in more harm than benefit. These guidelines offer support for a more selective and well-informed approach to the decision-making process surrounding prophylactic antibiotics. ■



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GET STARTED





Editor's Note: While the images presented here are authentic, the patient cases are hypothetical.

13-Year-Old With Inversion Injury



A 13-year-old boy presents to urgent care after “rolling” his left foot. He explains that he tripped on a cement curb while riding his skateboard. He has foot and ankle pain that is worse with weight. An x-ray is ordered.

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

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

**Differential Diagnosis**

- Left midfoot sprain
- 5th metatarsal avulsion fracture
- 5th metatarsal shaft fracture

Diagnosis

The correct diagnosis is an avulsion fracture of the base of the 5th metatarsal adjacent to the oblique apophysis. It does not involve the diaphysis, and there is no skin tenting or rotation. As seen in the image, normal apophysis is noted at the base of the 5th metatarsal as well as a transverse lucency at base of 5th metatarsal. Avulsion fracture is among the more common fractures of the foot and is predisposed to poor healing due to the limited blood supply to the specific areas of the 5th metatarsal base.

What to Look For

- On x-ray, a normal apophysis may be seen at the base of the 5th metatarsal
- Tenderness to palpation, erythema, or swelling at the base of the 5th metatarsal may be present

Pearls for Urgent Care Management

- Subtle avulsion fractures may require anterior posterior view or anterior posterior oblique (mortise) view of ankle to visualize
- Symptoms may last 2-6 months
- Nonoperative treatment includes protective weight bearing in a stiff soled boot or cast
- Follow-up with orthopedics or podiatry may be indicated for evaluation of operative management in cases of non-union



55-Year-Old With Diffusely Dry Skin



A 55-year-old woman presents to urgent care because of skin dryness and scaling on her legs that developed 2 weeks prior. The patient was recently diagnosed with psoriasis by a different provider and was treated with a combination therapy of tazarotene and a topical steroid for over 4 weeks. Diffuse dryness and white scales were seen on her legs.

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

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

**Differential Diagnosis**

- Acquired ichthyosis
- Atopic dermatitis
- Eczema craquelé
- Xerosis

Diagnosis

The correct diagnosis in this case is xerosis—a condition of rough, dry skin texture with associated fine scales, which is often pruritic. Incidence increases with age, and xerosis is typically caused by a decrease in the amount of lipids in the stratum corneum and a deficiency in the water-binding capacity of this layer. Environmental causes include factors such as low humidity, frequent bathing, and harsh soaps. Disease states such as ichthyoses, atopic dermatitis, hypothyroidism, Down syndrome, renal failure, malnutrition, HIV, lymphoma, liver disease, Sjögren syndrome, and carcinomatosis can also cause the condition.

What to Look For

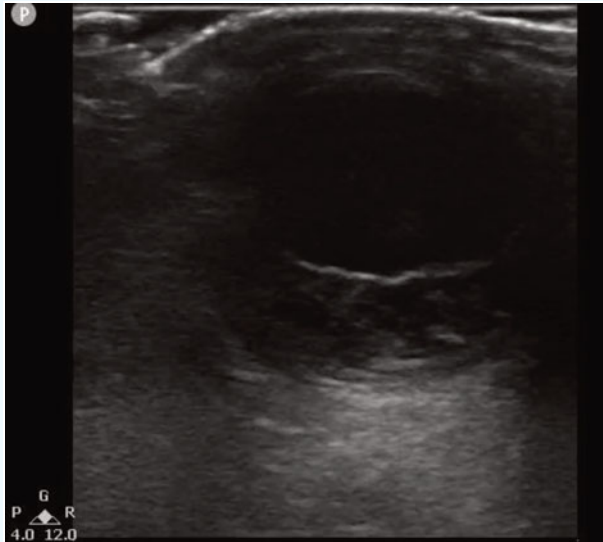
- Xerosis is more common in older patients
- Dry ashy skin with fine scale will be visible
- Pruritus is frequently present

Pearls for Urgent Care Management

- Encourage the patient to use mild skin cleansers and minimize skin washing
- Use a humidifier indoors to increase air humidity
- Moisturize the skin with thick and greasy emollients



63-Year-Old With Sudden Visual Disturbance



A 63-year-old man presents to urgent care with sudden-onset floaters and blurred vision in his right eye for one day. He denies trauma, headache, or flashes of light. He has no history of similar symptoms. His past medical history includes hypertension and type 2 diabetes.

Vital signs are normal. Visual acuity measures 20/40 OD and 20/25 OS. No facial asymmetry or eyelid swelling is noted. Visual fields are intact bilaterally. A non-dilated fundoscopic exam is attempted but is limited. Blood glucose is within normal limits. With concern for retinal pathology, a point-of-care ultrasound (POCUS) of both eyes is performed using a linear probe over closed eyelids.

View the POCUS images above and consider the likely diagnosis and next steps. The resolution of the case is described on the following page.

Case provided by Tatiana Havryliuk, MD, emergency physician in New York, NY, and founder of Hello Sono.

Differential Diagnosis

- Posterior vitreous detachment (PVD)
- Retinal detachment
- Vitreous hemorrhage
- Retinal tear
- Retinal hemorrhage
- Ocular migraine
- Optic neuritis
- Retinal arterial or venous occlusion
- Diabetic retinopathy

Diagnosis

POCUS of the right eye revealed a thin, mobile, echogenic (white) membrane in the vitreous chamber, not tethered to the optic nerve, consistent with PVD. Scattered mobile hyperechoic opacities were also noted—suggestive of vitreous hemorrhage. The unaffected eye showed no such findings.

Based on the POCUS findings—showing no signs of retinal detachment—and the patient's relatively preserved visual acuity, the provider arranged next-day follow-up with ophthalmology rather than immediate emergency department referral. The ophthalmologist confirmed the diagnosis of PVD with associated vitreous hemorrhage and initiated expectant management with close outpatient monitoring.

Discussion

PVD must be suspected when a patient presents with sudden floaters. The incidence of PVD rises with age, affecting 11–46% of those aged 65–90 years.¹ PVD results from the separation of the posterior vitreous cortex from the retina, often due to age-related vitreous degeneration or trauma.² Although PVD is usually benign, patients are at increased risk for retinal tears or detachment, particularly in the first 6 weeks following symptom onset.^{3,4} The presence of vitreous hemorrhage or reduced visual acuity (worse than 20/40) elevates this risk.⁴

POCUS has emerged as a valuable tool for evaluating acute vision changes when direct fundoscopy is inconclusive or technically challenging.^{5,6} Sonographic findings of PVD include a thin, mobile, hyperechoic membrane seen floating in the vitreous chamber. Unlike retinal detachment, this membrane is not tethered to the optic disc.⁷ Vitreous hemorrhage appears as swirling, mobile echogenic debris within the vitreous chamber.^{7,8} A recent meta-analysis found that ocular POCUS performed by emergency physicians had sensitivities of 94% for retinal detachment, 90% for vitreous hemorrhage, and 67% for PVD.⁹

Rapid POCUS evaluation can help differentiate urgent vision-threatening pathology (eg, retinal detachment) from benign conditions (eg, isolated PVD) that can be managed with outpatient follow-up. For urgent care providers, this distinction is critical in optimizing resource utilization and patient outcomes.

What to Look For

- A mobile, hyperechoic membrane in the posterior chamber not tethered to the optic nerve indicates PVD
- Hyperechoic particles in the vitreous suggest vitreous hemorrhage
- A ribbon-like flap tethered at the optic disc is consistent with retinal detachment

Pearls for Urgent Care Management

- Ocular POCUS is a simple, accurate tool for evaluating acute visual complaints when ophthalmoscopy is inconclusive
- If retinal detachment is suspected—even with preserved vision—immediate ophthalmology referral is critical¹⁰
- Patients diagnosed with PVD should be educated about the risk of retinal tear/detachment. Advise them to seek prompt care if symptoms worsen or vision deteriorates

References

1. Weber-Krause B, Eckardt C. Incidence of posterior vitreous detachment in the elderly. *Ophthalmology*. 1997;94(9):619–623.
2. Flaxel CJ, Adelman RA, Bailey ST, et al. Posterior Vitreous Detachment, Retinal Breaks, and Lattice Degeneration Preferred Practice Pattern. *Ophthalmology*. 2020;127(1):P146–P181.
3. Hollands H, Johnson D, Brox AC, et al. Acute-onset floaters and flashes: is this patient at risk for retinal detachment? *JAMA*. 2009;302(20):2243–2249.
4. Bond-Taylor M, Jakobsson G, Zetterberg M. Posterior vitreous detachment—prevalence and risk factors for retinal tears. *Clin Ophthalmol*. 2017;11:1689–1695.
5. Blaivas M, Theodoro D, Sierzenski PR. A study of bedside ocular ultrasonography in the emergency department. *Acad Emerg Med*. 2002;9(8):791–799.
6. Mackay DD, Garza PS, Bruce BB, et al. The demise of direct ophthalmoscopy: a modern clinical challenge. *Neurolog Clin Pract*. 2015;5(2):150–157.
7. Baker N, Amini R, Situ-LaCasse EH, et al. Can emergency physicians distinguish retinal detachment from posterior vitreous detachment with POCUS? *Am J Emerg Med*. 2018;36(5):774–776.
8. Lahham S, Shniter I, Thompson M, et al. POCUS in diagnosing retinal detachment, vitreous hemorrhage, and vitreous detachment. *JAMA Netw Open*. 2019;2(4):e192162.
9. Lahham S, Shniter I, Thompson M, et al. *JAMA Netw Open*. 2019;2(4):e192162.
10. Feltgen N, Walter P. Rhegmatogenous retinal detachment—an ophthalmologic emergency. *Dtsch Arztebl Int*. 2014;111(1–2):12–22.



33-Year-Old With Pleuritic Chest Pain

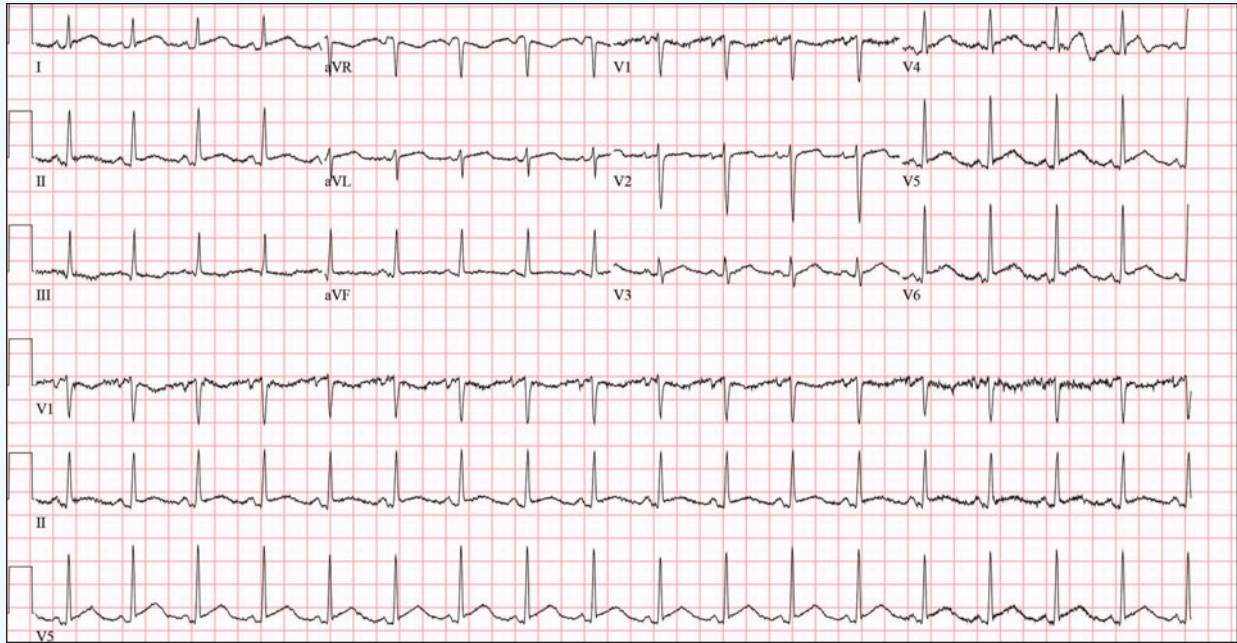


Figure 1: Initial ECG

A 33-year-old female presents to urgent care with pleuritic chest pain that is gradual in onset over the preceding several days and worse when lying flat. She denies fever, cough, and shortness of breath. She is well appearing with normal vital signs. An ECG is obtained.

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 Benjamin Cooper, MD, MEd, FACEP, McGovern Medical School at the University of Texas Health Science Center at Houston

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

ECG STAMPEDE

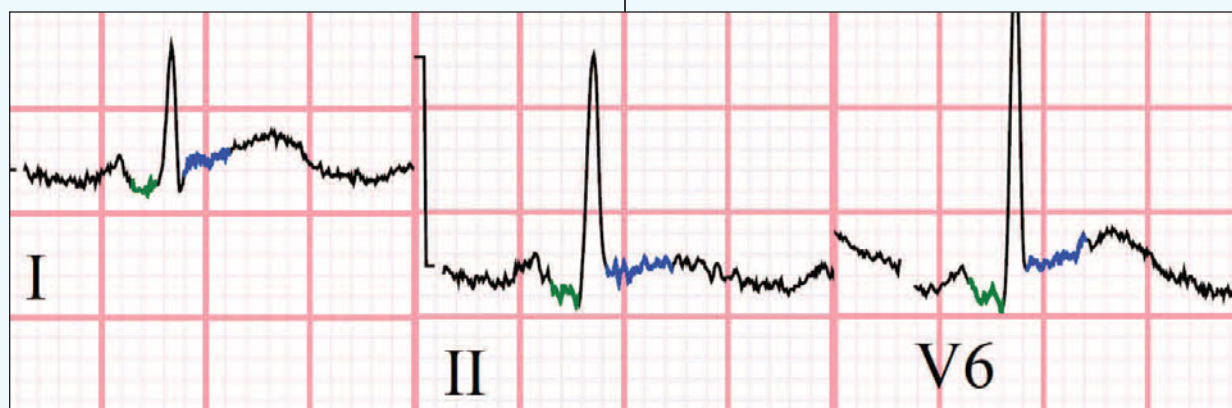


Figure 2: Blown-up images of PQRST complexes in leads I, II, and V6. PR-segment depressions are in green and concave up ST-segment elevations are in blue.

Differential Diagnosis

- Early repolarization
- Hyperkalemia
- Acute pericarditis
- ST-elevation myocardial infarction
- Brugada syndrome

Diagnosis

The diagnosis in this case is acute pericarditis. The ECG reveals sinus tachycardia with a rate of 108 beats per minute. There are diffuse, concave up ST-segment elevations without reciprocal changes and diffuse PR-segment depression (Figure 2).

Discussion

Acute pericarditis is an inflammatory condition of the pericardium, often causing symptoms like pleuritic chest pain that improve when leaning forward. Common causes include medications (eg, hydralazine, penicillin), infections (bacterial, viral, or fungal), malignancies, rheumatologic conditions (eg, lupus, rheumatoid arthritis), post-myocardial infarction syndromes (eg, Dressler syndrome), uremia, and idiopathic origins.¹ Diagnosis requires meeting 2 out of 4 criteria:^{2,3}

1. Typical symptoms (pleuritic, sharp chest pain relieved when leaning forward)
2. New pericardial effusion
3. Presence of a friction rub
4. Typical ECG findings

Differentiating pericarditis from ST-elevation myocardial infarction (STEMI) can be challenging, but careful attention to several electrocardiographic features can help. Features suggesting pericarditis over STEMI include diffuse concave up ST elevations without reciprocal changes, PR depression, PR elevation in aVR, ST-elevation in lead II greater than lead

III, and Spodick's sign (down-sloping of the TP segment).⁴ The test characteristics of any single electrocardiographic feature are insufficient to rule in/out pericarditis; the feature with the highest odds ratio for predicting STEMI (over pericarditis) is reciprocal ST-depressions. Acute pericarditis tends to follow a natural progression of electrocardiographic findings, starting with the aforementioned features in the first two weeks, followed by resolution of ST elevation, T wave flattening, T wave inversion, and finally returning to baseline over several weeks (Figure 3).⁵

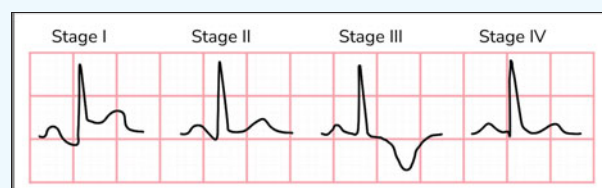


Figure 3: Morphologic features of the various stages of pericarditis.

Treatment includes non-steroidal anti-inflammatory medications tapered over 3-4 weeks and colchicine for 3 months. It's also reasonable to prescribe a proton pump inhibitor to counteract gastrointestinal side effects. Corticosteroids are reserved for patients with contraindications to initial therapy but are not preferred due to increased recurrence.²

Although early repolarization can produce similar ECG patterns, the patient's presenting symptoms favor acute pericarditis. Hyperkalemia can cause various ECG changes, but it does not typically result in the diffuse, concave-up ST elevation observed here. Furthermore, Brugada syndrome, characterized by ST elevation in leads V1 and V2 due to a sodium channelopathy, is inconsistent with the presented ECG.

What To Look For

- Electrocardiographic features that suggest acute pericarditis include diffuse concave up ST elevations without reciprocal changes, PR depression, ST-elevation in lead II greater than lead III, and Spodick's sign (down-sloping of the TP segment).
- The presence of reciprocal ST-changes is very specific for an occlusive process.

Pearls For Initial Management, Considerations For Transfer

- Patients with a clear diagnosis of acute pericarditis with a benign etiology and reliable follow up can be initiated on non-steroidal anti-inflammatory medications +/- colchicine.
- Pericardial effusion must be considered in all cases of pericarditis; however, clinically meaningful effusions occur in less than 3% of cases of acute pericarditis. It is worth noting that pericardial tamponade is more common in patients with identifiable causes compared to idiopathic cases.³ Tamponade and myocarditis should be considered in patients with tachycardia and/or hypotension; ED referral is indicated in such cases.

- If the diagnosis is in question, the etiology is unclear, vital signs are unstable, or the patient lacks reliable follow up, referral to an emergency department is appropriate.

References

1. Mattu A, Tabas J, Brady W. Electrocardiography in Emergency, Acute, and Critical Care. 2nd ed. The American College of Emergency Physicians; 2019.
2. LeWinter MM. Acute Pericarditis. *NE J Emerg Med.* 2017;371(25):349-359. doi:10.1016/j.pcad.2016.12.001
3. Cremer PC, Klein AL, Imazio M. Diagnosis, Risk Stratification, and Treatment of Pericarditis: A Review. *JAMA.* 2024;332(13). doi:10.1001/JAMA.2024.12935
4. Witting MD, Hu KM, Westreich AA, Tewelde S, Farzad A, Mattu A. Evaluation of Spodick's Sign and Other Electrocardiographic Findings as Indicators of STEMI and Pericarditis. *J Emerg Med.* Published online March 2020. doi:10.1016/j.jemermed.2020.01.017
5. Spodick DH. Diagnostic electrocardiographic sequences in acute pericarditis. Significance of PR segment and PR vector changes. *Circulation.* 1973;48(3):575-580. doi:10.1161/01.CIR.48.3.575

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Navigating Payer Reviews and Medical Decision-Making: A Critical Guide for Urgent Care

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

Urgent care operators face increasing challenges from payer reviews—a situation exacerbated by ongoing confusion around coding guidelines and proper documentation of medical decision-making (MDM). As more urgent care providers grapple with administrative burdens and financial pressures, understanding how to document and code accurately has never been more important.

The Rise of Payer Reviews

Pre-payment reviews have become commonplace, initiated when a provider's billing patterns—such as a higher frequency of level 4 visits compared to peers—trigger payer scrutiny. Practices might receive notification letters identifying the providers and codes under review while also requiring medical records submission at the initial claim filing. Failure to submit the records often leads to claim denials and payment delays. Alarming, these reviews are often subjective with no clear benchmarks for removal, making provider experiences highly variable.

Post-payment reviews are equally challenging. Often conducted by recovery companies like Cotiviti or MCMC, these audits involve requests for medical records for past services, potentially leading to substantial repayment demands. Missteps, such as using outdated 1995 guidelines for claims filed after 2021, misunderstanding data review requirements, or minimizing the seriousness of conditions like COVID-19, have been cited as common errors.

When payers demand repayment, they often seek the full claim amount, not just the differential between billed and “corrected” services. Negotiation and counteroffers

become vital, particularly when extrapolated repayment demands soar into 6 figure territories.

Accurate Documentation: The Key to Success

With coding guidelines now focusing heavily on MDM, clear documentation reflecting the scope of problems addressed during visits is critical. Providers must go beyond recording final diagnoses. Documenting the differential diagnosis process, including history, exam findings, and diagnostic reasoning, is essential both for accurate coding and excellent patient care.

Instituting a formalized education process helps. Appointing a coding champion who liaises between clinicians and billing teams ensures consistent, real-time feedback. Since many providers are unaware of the nuanced changes in coding rules, ongoing education can dramatically reduce pre-payment review occurrences. Moreover, when practices under pre-payment reviews fail to adapt, audits are extended, compounding delays and financial risk.

Mastering the Language of Medical Decision-Making

The MDM table in CPT guidelines can be subjective and confusing, especially regarding terminology under its 3 main elements: Problems Addressed; Amount and Complexity of Data Reviewed; and Risk of Complications.¹

Clarifying Problems Addressed

Terms like “acute” and “self-limited” cause frequent confusion. “Acute” does not necessarily mean “new” but instead refers to recent or short-term problems, even follow-ups to previously treated conditions. Coders must understand that “self-limited” or “minor” problems are those likely to resolve without medical intervention, like the common cold or minor injuries.

When it comes to exacerbations, documentation is key. Providers must describe the severity of any worsening con-



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ditions to justify higher MDM levels. Without clear notes, coders must assume moderate severity, which can impact appropriate code selection.

Additionally, understanding when a problem is truly "addressed" during an encounter is vital. According to CPT guidelines, a problem is only considered addressed if it is evaluated or treated at the encounter by the provider reporting the service. Merely noting that another professional is managing the issue, without further assessment or coordination, does not meet the threshold.

The complexity of a problem is not solely determined by the final diagnosis. In many cases, a thorough evaluation is needed to rule out highly morbid conditions, and the associated work itself may raise the MDM level. For instance, several seemingly minor symptoms could suggest a serious condition, thereby warranting a higher complexity score. Also, multiple low-severity problems addressed in a single visit can cumulatively elevate the risk profile. Thus, providers should carefully document all conditions managed and explain any decision not to pursue further testing or treatment due to risk/benefit considerations.

Demystifying Data Review

The Amount and Complexity of Data Reviewed category is another frequent stumbling block. However, coders should remember that only 2 out of 3 MDM elements need to meet a level for code selection. If Problems Addressed and Risk of Complications clearly support a high-level code, intricate calculations around data complexity become unnecessary.

That said, data element understanding remains important for provider education. Helping providers understand when and how their documentation affects coding accuracy can preempt future review issues.

Understanding Risk of Complications

In MDM, "risk" pertains to the treatment plan, not the inherent patient risk. For instance, treating gastroenteritis with over-the-counter medication and home care recommendations constitutes low treatment risk, even if the patient's symptoms seem serious. Coders must base risk assessment on documented plans, not their own interpretations of patient condition severity.

The CPT guidelines clarify that even a low probability of death might still equate to a high-risk classification, depending on the treatment complexity. Therefore, establishing open communication with providers about their clinical thought processes becomes essential. If provider notes do not clearly indicate risk, coders should default to the lowest reasonable risk level to maintain compliance.

Unique Tests, Independent Historians, and External Discussions

Additional nuances affect coding accuracy. A "unique test" is defined by a single CPT code, regardless of the number of times it is performed. Ordering and reviewing a test counts as 1 single data point, not 2. Independent interpretation of results (not merely review) adds to data complexity but only if the provider isn't billing for the test themselves.

Moreover, discussions with external providers — not those within the same group — count toward MDM complexity. Even communication with emergency department staff regarding a referred patient qualifies. Independent historians, such as parents or caregivers, bolster the documentation in cases where patient history is incomplete, but translators do not fulfill this role.

"The path to fewer audits and faster reimbursements lies in proactive documentation improvement."

Building a Stronger Documentation Culture

The path to fewer audits and faster reimbursements lies in proactive documentation improvement. Structured provider education, regular feedback loops, and the establishment of a "coding champion" can drive better documentation habits. Urgent care operators who invest in training and robust internal review systems are better positioned to navigate payer scrutiny successfully.

Ultimately, accurate coding is not merely about revenue. It aligns directly with delivering better patient care and ensures compliance with ever-evolving payer requirements. By demystifying MDM concepts, embracing ongoing education, and fostering provider-coder collaboration, urgent care practices can turn the tide against costly audits and secure their financial and operational future. ■

Reference

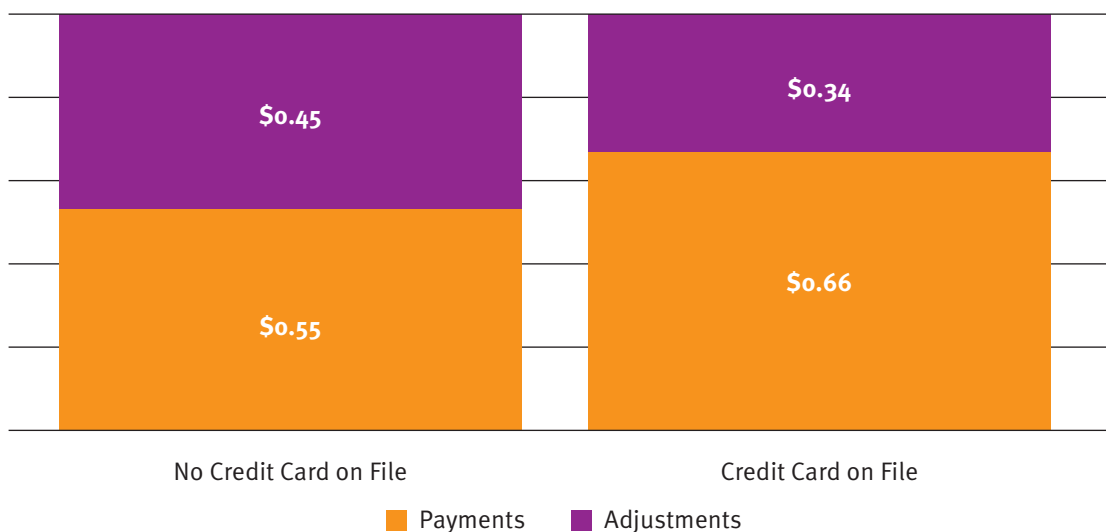
1. American Medical Association. CPT Revised Medical Decision Making (MDM) Grid. Published June 2019. Accessed April 29, 2025, at <https://www.ama-assn.org/system/files/2019-06/cpt-revised-mdm-grid.pdf>



Patient Credit Card on File Increases Payments by 20%

■ Alan A. Ayers, MBA, MAcc

PAYMENTS AND ADJUSTMENTS PER \$1 OF BILLED CHARGES



Source: Experity Analysis

Just as hotels require a credit card to cover any “incidentals,” urgent care is increasingly pre-authorizing patient credit cards at the time of service to cover any patient balances after their insurance claims adjudicate. Patient balances are often attributed to deductibles, co-insurance, or eligibility issues that can be difficult to identify at registration.

Charging a patient’s credit card when an explanation of benefits is received should, in theory, reduce accounts receivable days, write-offs, and collections costs versus mailing statements, awaiting payment, and processing patient remittances.

An Experity analysis of 392,699 comparable urgent

care visits in 2024, in which the patient used Blue Cross Blue Shield insurance and a CPT 99204 code was charged, showed that payments were 21.7% higher for patients who provided a credit card on file versus those who did not. Applying these percentages to billed charges of \$250, for example, would result in increased collections of \$27.

Every practice in the analysis experienced increased collections for patients with a credit card on file, ranging from an average of \$6 to \$38 per CPT 99204 billed. This data is only considering payments, adjustments, and unpaid balances on the CPT 99204 line item of each claim. New data confirms that having a credit card on file also increases net collections by reducing write-offs.

Before claims were zeroed out, the unpaid balance of patients who did not place a credit card on file was found to be 2 to 2.5 times greater than for those in which the card was charged. ■



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