

JUCM[®]

THE JOURNAL OF URGENT CARE MEDICINE[®]

www.jucm.com

The Official Publication of the UCA, CUCM, and UCCP

MARCH 2025
VOLUME 19, NUMBER 6

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ASSOCIATION

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CLINICAL **cme**

Postpartum Headache: When to Suspect Serious Conditions

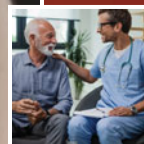
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CLINICAL

23 Postpartum Presentations: When Risk Arises After Delivery – Headache

Common and serious postpartum conditions may present in urgent care, and understanding differential diagnoses is key to appropriate evaluation and disposition. Headache presentations should prompt consideration for possible postpartum preeclampsia, cerebral venous thrombosis, or post-dural puncture headache.

Alexa Bailey, BS; Lauren Kostandaras, BS; Hannah Poorman, BS; Michael Weinstock, MD; Catherine Neal, DO

ORTHOPEDIC CASE SERIES

15 Urgent Care Evaluation and Management of Hip Osteoarthritis

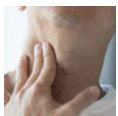


Osteoarthritis of the hip is a common condition that can lead to pain and decreased mobility. Best practices for management in urgent care should prioritize ruling out more serious diagnoses such as fracture, septic arthritis, and avascular necrosis of the femoral head.

Alex Dragota, BS; Matthew Baird, MD; Michael Weinstock, MD

CASE REPORT

31 Death After Delayed Diagnosis of Acute Epiglottitis in an Adult Patient Initially Seen in Urgent Care: A Case Report



Epiglottitis is a potentially fatal condition that has undergone changing etiology since the adoption of the *Haemophilus influenzae* type B vaccine. Urgent care providers should be well versed on its presentation to properly triage patients and avoid misdiagnosis.

William Bradley, BA

PRACTICE MANAGEMENT

37 Shorter Visits Drive Greater Patient Satisfaction in Urgent Care



Urgent care has long marketed itself as providing immediate care, and true to this reputation, an analysis shows the greatest predictor of patient satisfaction is visit duration. Net promoter scores offer comparative insight on patient views.

Alan A. Ayers, MBA, MAcc

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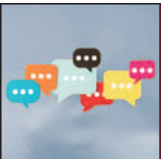
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JUCM printed edition is published monthly except for August for \$50.00 by Braveheart Group LLC, 11 E Sundial Circle, PO Box 5156, Carefree, AZ 85377. Standard postage paid, permit no. 372, at Lancaster, PA, and at additional mailing offices. POSTMASTER: Send address changes to Braveheart Group
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URGENT INTERACTIONS



*"If you want to thrive, you first have to survive.
Take care of yourself."*

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



"We learn best from cases that are neither obvious nor esoteric. We might understand more by studying a case and discovering that we ourselves might have handled a certain patient in that same certain way. It is only by putting ourselves 'in the footsteps' that we can recognize some of the subtleties that allow us to progress from standard of care to excellence in care."

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



"Best in class urgent cares accept patients until 7:59 PM because they realize the last 2 or 3 patients of the day make the difference between achieving profitability for the entire day or not."

— **Alan A. Ayers, MBA, MAcc**
President of Urgent Care Consultants and JUCM Senior Editor



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GET STARTED





Documentation Excellence: The Trifecta

■ Brad Laymon, PA

In the dynamic environment of urgent care (UC) medicine, precise, and thorough documentation serves as a cornerstone for both clinical and operational success. Beyond merely fulfilling regulatory requirements, documentation excellence has 3 critical functions, which I refer to as the “trifecta:” 1. Improved patient outcomes through clear communication of care; 2. Mitigation of malpractice risk through clear and defensible explanation of medical decision making (MDM); and 3. Accurate description of complexity to allow for appropriate medical coding. By addressing these 3 distinct functions of the medical record, UC clinicians can ensure optimal care for patients and that their care is well justified and reimbursed fairly.

1. Improved Patient Outcomes

Understanding a patient’s past medical history (PMH) and prior episodes of care is obviously critical for our MDM. Therefore, it cannot be overstated how important comprehensive and clear documentation is for ensuring the delivery of high-quality patient care. As UC clinicians, we treat patients with acute, complex, and time-sensitive needs every shift. Creating an accurate record of our care is crucial for ensuring that subsequent clinicians who see the patient for follow-up understand our MDM and what we have done for the patient. Our documentation provides the foundation for this communication among our fellow healthcare professionals.¹ In other words, our chart should tell a coherent and concise story. Our diagnosis and plan should be supported by the history and exam.

Key components of documentation for optimal patients’ outcomes include:

- **Thorough history and exam findings:** Include all relevant history, detailed physical examination findings pertinent to the chief complaint, and important negatives/absent features of their presentation to create a complete clinical picture.
- **Diagnostic justification:** Provide the clinical rationale for the diagnostic tests ordered or omitted and ensure they align with the patient’s clinical presentation.
- **Clear treatment plans:** Outline specific, actionable treatment plans and discuss alternatives if applicable. For example, over the counter (OTC) analgesia PRN (as needed) is vague. It’s more helpful to document acetaminophen 1,000mg every 8 hours PRN, for instance.
- **Clear follow-up plan and patient understanding:** Clearly document follow-up recommendations and verify the patient’s understanding of instructions and agreement with the treatment plan. A follow-up plan should be time specific (eg, follow-up in 5-7 days) and action specific (eg, here or with your primary care provider [PCP]).

Appropriate documentation supports improved outcomes in the following ways:¹

- **Prevents miscommunication:** Accurate and detailed records reduce the likelihood of misunderstanding and subsequent medical errors during transitions in care. We’ve all encountered scenarios where we are seeing a patient who “bounces back” and can understand the implications of having to guess what happened at the initial visit because it was not clearly charted.
- **Facilitates early interventions:** Documentation of risk factors and clinical findings can prompt timely interventions and reduce complications. In UC, we often see patients who have gaps in primary care and standard preventative screenings. By reviewing chronic conditions, we can serve as the last line of defense against overlooked chronic care deficiencies.



Brad Laymon is a Physician Assistant with over 26 years of experience in urgent care medicine. He is also certified as a Professional Coder and an Evaluation and Management Coder and is the founder of Coding Excellence, LLC, a medical coding and documentation consulting firm.

Table 1. Example of Excellence in Documentation**Substandard Documentation**

"Patient presents with chest pain. Given aspirin. ECG is normal. He is alert and oriented X 3 and vital signs are stable. Referred to ED."

Exemplary Documentation

"43-year-old male presents with retrosternal chest pain for 2 hours, radiating to the left arm, associated with diaphoresis. Vital signs: BP 140/85, HR 95, SpO₂ 98% on room air. Denies nausea, vomiting, or prior similar episodes. ECG performed shows normal sinus rhythm with no acute ST changes. Cardiac exam unremarkable, lungs clear to auscultation. Given 325 mg aspirin, IV access established, and referred to the emergency department for further evaluation to rule out acute coronary syndrome. Patient counseled on the importance of immediate evaluation; he verbalized understanding and agreed to proceed."

- **Enhances chronic disease management:** For patients with recurrent conditions, documentation of past treatments and outcomes is useful for creating the most effective plan. If you review charts from psychiatrists, you'll often find good examples of this practice. For example, in patients with depression, a list of previously attempted treatments with a short discussion of response and/or adverse reactions can be very helpful for ensuring that any subsequent medication trial is not duplicative or likely to cause harm.

Table 1 gives 2 examples of documentation. Notice how the enhanced clarity of the second example supports continuity of care through clear charting of critical information.

Tools to enhance documentation for outcomes include:

- **Clinical decision rules (CDR):** Tools such as the HEART score and PERC rule have been proven to assist in risk stratification of patients with potentially dangerous chief complaints such as chest pain and dyspnea. Integrating CDR tools and reminders within the electronic medical record (EMR) ensures that dangerous diagnoses are considered, and the clinical assessment of the of risk is justified.^{2,3}
- **Standardized protocols:** Use condition-specific templates to ensure no essential details in the history and physical exam are omitted. This "checklist" function can mitigate the risk of diagnostic error and improve patient safety.⁴ At the same time, it is important to allow the template to be modifiable to be specific to each patient encounter. Even 1 or 2 sentences of free text in the history and MDM can

Table 2. Example of Diabetes Documentation**Substandard Documentation**

"Diabetic foot pain. Check blood sugar daily. Advised rest and over-the-counter analgesics. Follow up with primary care provider or go to the ED if symptoms worsen."

Exemplary Documentation

"62-year-old male with a history of type 2 diabetes presents with left foot pain for 3 days. Denies trauma, fever, or chills. Examination reveals erythema, swelling, and a 2 cm ulcer on the plantar surface with purulent drainage. Pedal pulses palpable bilaterally. Sensory exam shows diminished sensation in the left foot. Foot XR does not show evidence of osteomyelitis. Diagnosis: diabetic foot infection. Initiated empiric oral antibiotic therapy with amoxicillin-clavulanate. Advised strict offloading and follow-up here or with PCP in 48 hours for reassessment. Patient educated on infection risks and signs of worsening. He understands to go to the ED if symptoms do not improve over the next 24 hours. He verbalized understanding and agreed with the treatment plan."

be sufficient for decreasing an impersonal impression of the encounter to subsequent readers.

- **Clinician education:** Given the central role of the EMR in modern UC practice, it is important that clinicians receive regular education on documentation updates and best practices.

Table 2 demonstrates how excellent documentation should capture the complexity of each case. The expanded documentation ensuring all relevant aspects of care are addressed and communicated, which directly supports better outcomes for the patient who presented with foot pain. While the exemplary documentation is longer, it is important to note that most EMRs will allow for macros (eg, "dot phrases") to be used for standard practices used with each patient. The use of these shortcuts can improve efficiency by including phrases such as "patient verbalized understanding of plan and emergency department (ED) precautions and all questions were answered prior to discharge."

2. Mitigation of Malpractice Risk

In the unfortunate event where a clinician is named in a lawsuit, their documentation of care is the primary piece of evidence; the quality of documentation is what determines if the chart will better serve the prosecution or defense of their care. Incomplete or vague documentation remains a significant factor in malpractice claims. Conversely, proper documentation serves as a clinician's strongest defense, illustrating adherence to the standard of care and demonstrating thorough clinical reasoning.⁵ Legal experts consistently emphasize that "if it's not

Table 3. Example of Documentation for Defensibility of Care**Substandard Documentation**

“Patient seen for leg swelling. No history of DVT. Homan’s sign is negative. Recommended use of compression stockings. Follow up as needed.”

Exemplary Documentation

“67-year-old female presents with unilateral left lower extremity swelling for 3 days. No history of trauma. Denies dyspnea, chest pain, or fever. Exam reveals pitting edema in the left calf, measuring 3 cm larger than the right. No erythema or warmth. Venous Doppler ultrasound ordered for later today to rule out DVT. Recommended compression stockings pending negative imaging results. Educated patient on potential causes, including DVT, and emphasized the importance of immediate follow-up. Documented understanding of risks and early warning signs requiring emergency care. She understands and agrees with the treatment plan.”

documented, it didn’t happen.”

Key elements of documentation to reduce medicolegal risks include:

- **Inclusion of a differential diagnoses:** Document the differential diagnoses considered, along with supporting or ruling-out criteria for dangerous diagnoses. There are debates about how exhaustive this list should be, but including at least a partial differential in the MDM is generally advisable as it demonstrates the clinician’s conscientiousness and diligence.
- **Medical decision making:** The MDM portion of the note is the primary location for justification of your care. In cases of adverse outcomes, expect that it will be scrutinized. For this reason, it is important to provide explicit reasoning for the diagnostic and treatment choices you make, including why certain options were excluded. Avoid using vague statements such as “monitor symptoms” or “follow up as needed,” which do not imply that clear, actionable counseling was given to the patient.
- **Informed consent and patient education:** Informed consent is a process, not a document. The critical aspects of informed consent are a discussion with a patient who has decision making capacity and documentation of their understanding about risks, benefits, and alternatives for treatments or procedures. Note patient questions and their level of understanding.⁶ For situations where there are various reasonable options, document a brief description of the shared decision-making process that went into the final treatment decision.⁷ When it is clear

that patients were involved in the decision process and opted for the treatment course selected, it is much more difficult to assign blame for an adverse outcome to the clinician.

- **Follow-up instructions:** Include time and action specific follow-up instructions and return precautions. (eg, “Contact your PCP if fever exceeds 101°F or the pain worsens within 48 hours. If you cannot be seen by your PCP that day, return to the UC immediately for reassessment”). While rarely necessary, it is prudent to include instructions on when to seek care in the ED and when the patient should call for emergency services (ie, 911).
- **Course of care while in the UC:** Document any changes in the patient’s condition and the resulting adjustments in care plans. Documentation should also include repeat vital signs and physical exam findings after treatments such as injections, nebulizer treatments, or any other in-clinic treatments. Regardless of treatments, significantly abnormal vital signs should be repeated to ensure they are normalizing or stable with a reasonable explanation. Certain abnormal vital signs, particularly tachycardia, have been shown to be associated with increased risk of adverse outcomes after discharge.^{8,9} Repeating vital signs to ensure they are not worsening and commenting on plausible causes of abnormalities which do not suggest serious pathology (eg, pain, anxiety) is an important tool for risk mitigation in such cases.

Table 3 demonstrates 2 versions of clinical reasoning. Notice how the thoroughness in the exemplary version differs from commonly seen, substandard documentation and the key aspects that differ to strengthen the defensibility of care.

How documentation mitigates legal risk:

- **Demonstrates adherence to standards of care:** Detailed records validate that clinical decisions were made based on established guidelines and common medical practices in similar situations.
- **Minimizes ambiguity:** Comprehensive documentation eliminates gaps that could be misinterpreted during legal review.
- **Supports continuity of care:** Accurate records reduce errors in ongoing management, thereby limiting the risk of adverse events due to confusion in interpretation of the EMR by subsequent clinicians.

Consider how the real-world case in **Table 4** demonstrates clear clinical reasoning and proactive patient communication.

Table 4. Example of Abdominal Pain Documentation**Substandard Documentation**

"Abdominal pain. Vital signs stable and he is in no distress. Referred to ED."

Exemplary Documentation

"35-year-old male presents with periumbilical abdominal pain for 24 hours, migrating to the right lower quadrant. Exam reveals tenderness at McBurney's point with guarding and rebound. Discussed my concern for the possibility of appendicitis, which may necessitate emergency surgery. Patient understands concern. Referred immediately to the ED for further evaluation and management. He was offered EMS transport but declined. His wife will drive him directly to the ED."

Imagine now that the patient above was diagnosed with ruptured appendicitis when he ultimately presented to the ED 2 days later. In the first example, the documentation does not support that the clinician expressed concerns over the possibility of appendicitis or needing emergent intervention. Compare this to the second example. The chart clearly documents communication of the concern and the implications of a diagnosis of appendicitis. For higher risk cases (ie, where there's suspicion for possible serious diagnoses), it is important to take an extra moment to ensure that your care, concern, and communication are clearly charted. These are the cases where there's the highest risk for an adverse outcome, and it is critical to ensure that recognition of this possibility is apparent through your documentation.

3. Accurate Medical Coding

While the topic may seem mundane, clinicians have an ethical mandate that patients are billed appropriately for the care they receive. Accurate and thorough documentation is the cornerstone of proper medical coding, which directly affects reimbursement, compliance, and financial sustainability. Poor documentation can lead to both claim denials and overcoding, which can have significant financial and administrative repercussions. Coders and coding algorithms rely on the details of the medical record to assign the appropriate codes that reflect the complexity and specificity of the services provided.

Key considerations for accurate coding for billing purposes include:¹⁰

- **Specific terminology:** Use precise clinical language to support the highest level of coding specificity. For example, if a patient has an asthma exacerbation, documenting whether they have intermittent or persistent asthma may affect the complexity of care.

Table 5. Example of Appropriate Documentation for Accurate Assignment of CPT and ICD-10 Codes**Substandard Documentation**

"Laceration repair. 2 cm laceration closed with 4 -0 nylon sutures. Follow up in 7-10 days."

Exemplary Documentation

"2 cm linear laceration on the dorsal surface of the left hand, extending into the dermis. Wound irrigated with 500 mL normal saline. Local anesthesia achieved with 1% lidocaine without epinephrine. Layered closure performed with four 4-0 nylon sutures. Patient advised on wound care, signs of infection, and follow-up in 7 days for suture removal."

- **Diagnosis and procedure linkage:** Ensure all diagnoses are explicitly associated to the relevant procedures and treatments administered.
- **Clear procedure notes:** For lacerations and abscesses, ensure that the location, size, complexity of repair/drainage, technique, and materials used are documented to accurately reflect the procedure performed.

This level of specificity in **Table 5** ensures the correct Current Procedural Terminology (CPT) code and International Classification of Diseases (ICD-10) diagnosis are assigned. Accurate CPT codes are the basis for appropriate reimbursement and compliance.¹¹

Benefits of accurate medical coding include:

- **Optimized reimbursement:** Detailed documentation ensures claims are not denied and reimbursement is not delayed due to lack of clarity or supporting information.
- **Audit protection:** Complete and specific records reduce the risk of coding errors which may result in penalty if identified during payer audits.
- **Compliance with regulations:** Accurate coding prevents unintentional violations of payer policies, safeguarding against penalties.

Common documentation pitfalls relevant to billing and coding to avoid include:

- Vague descriptions of chief complaints like "follow-up visit" without context or clinical findings.
- Failing to document patient non-adherence or patient declination of recommended tests or treatments.

The examples of documentation in **Table 6** demonstrate variable precision in language, which can have significant effects on appropriateness of coding for both the procedure and the associated diagnosis.

High-yield tips and strategies for achieving the "trifecta" include:

- **Use of standardized templates:** Utilize chief com-

Table 6. Example of Documentation for Complex Abscess with Incision and Drainage**Substandard Documentation**

"Incision and drainage of abscess."

Exemplary Documentation

"3 cm fluctuant abscess on the left axilla, erythematous and tender to palpation. Area prepped with chlorhexidine. Local anesthesia achieved with 5mL of 1% lidocaine with epinephrine. Incision made with #11 blade, and 10 mL of purulent material expressed. Cavity irrigated with normal saline and dressing applied. Patient advised on dressing changes, signs of worsening infection, and follow-up here in 48 hours for wound check. Patient verbalized understanding."

plaint specific templates designed to prompt comprehensive documentation. Ensure simultaneously that the templates allow for flexibility for various types of presentations. The use of such templates can reduce omissions and oversights and improve consistency across clinicians.

- **Engage in ongoing education:** Periodic training sessions to review updates on documentation best practices, coding guidelines, and medicolegal considerations can serve as important reminders for standards of care and ensure awareness of relevant updates (eg, revision in evaluation and management coding).
- **Solicit audits and feedback:** Request periodic audits from peers, supervisors, and coding professionals to assess the quality of your documentation for all aspects of the trifecta. This offers the opportunity for actionable, specific, and constructive feedback.
- **Embrace technological integration:** Leverage functions within the EMR. For example, practice using embedded CDRs and macros to enhance documentation quality and efficiency. If available and approved for use in your UC center, try using documentation and/or artificial intelligence scribing applications.
- **Support a collaborative environment:** Encourage open communication between clinicians, staff, and coders when ambiguities are identified

Conclusion

For better or worse, the quality of our care is largely judged based on the quality of our documentation. Excellence in medical documentation, therefore, is far more than an administrative responsibility, but rather

represents a fundamental skill with implications for every aspect of UC practice. By striving to achieve the trifecta—improved patient outcomes, mitigation of malpractice risk, and accurate medical coding—clinicians can protect their patients, themselves, and their UC center. ■

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Dateline: Washington, D.C.

■ Lou Ellen Horwitz, MA

On February 5, a group of Urgent Care leaders returned to our nation's capital to continue the work toward federal payment reform. The new administration had just settled in, and there were signs of turnover everywhere you looked: offices under reconstruction; evidence of recent unpacking; reporters everywhere; protestors on a few corners; phones ringing off the hook in every office; circles under more than a few eyes; and emotions both high and low on display. We were not alone; many groups were vying for facetime. In some ways, it made the average crazy day in an Urgent Care look calm and easy!

We spent hours with Senate staff (and a few Senators) advocating for the next step in our strategy. As important as I know that payment reform is to all of us, I also know how busy you are. If you're not familiar with our efforts, I encourage you to visit our Advocacy section on our website for more details. We also send updates on our progress via Advocacy Alerts – be sure to subscribe.

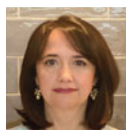
Urgent Care's Role

Our last D.C. visit in late 2023 focused on the House, successfully asking the Centers for Medicare & Medicaid Services (CMS) to take a closer look at Urgent Care's role in reducing inappropriate emergency department (ED) visits, the cost savings that result, and how we can incentivize and encourage Urgent Care growth to expand that impact. In the 2025 Medicare Physician Fee Schedule (MPFS), CMS included a Request for Information that elicited responses but no pushback. The next step is for CMS to take action on the ideas we've promoted in the 2026 MPFS.

Aside from the general chaos resulting from a new administration moving in, we took note of a few trends in our Congressional conversations:

- Urgent Care is widely recognized in every state and every level. All staff we encountered were familiar with Urgent Care, having personally visited one in the last year.
- The visit types ranged from the upper respiratory issues to orthopedics and pediatric care. Even in locations with very few Urgent Care centers, Urgent Care is top of mind for episodic illness and injury.
- The distinction between Urgent Care and retail clinics is clear—this is huge progress for us.
- Everyone was surprised to learn that we are paid like regular physician offices. Those that understood how healthcare payment works assumed that we had our own rates under Place of Service (POS) 20. This was the opening we needed.
- Everyone “got it” once we explained our goal for CMS create a new POS for “Enhanced Urgent Care” that recognizes the full scope of real Urgent Care (vs those who are “urgent care” from 5-7PM on weekdays with no x-ray, etc.) with payments that align with our actual capacity and work.
- Currently, most offices are hesitant to move our proposals forward. With the start of the new administration and all the recent changes, there was plenty of interest but hesitancy in making firm commitments.

Now the hard work really begins, and our focus will intensify now through April when CMS puts serious pen to paper for 2026. Yes, that is how early it happens, so time is of the essence. We are so thankful to the members who took time to help us advocate, and the staff who work on this every day with our lobbyists. We'd love your continued support to push this over the finish line. Visit urgentcareassociation.org to learn more and get involved! ■



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



CONTINUING MEDICAL EDUCATION

Release Date: February 1, 2025
Expiration Date: January 31, 2027

Target Audience

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Learning Objectives

Upon completion of this educational activity, the learner will be able to:

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

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CONTINUING MEDICAL EDUCATION

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Urgent Care Evaluation and Management of Hip Osteoarthritis (page 15)

1. What are the most common symptoms of hip osteoarthritis?

- a. Groin or hip pain that worsens with activity
- b. Stiffness after inactivity
- c. Reduced range of motion
- d. Grinding sensation with movement
- e. All of the above

2. What is the initial imaging study of choice for patients presenting with hip pain?

- a. Magnetic resonance
- b. Computed tomography
- c. Plain x-ray
- d. Ultrasound

3. Which x-ray finding may suggest hip osteoarthritis?

- a. Joint space narrowing
- b. Osteophytes
- c. Subchondral sclerosis
- d. All of the above

Postpartum Presentations: When Risk Arises After Delivery – Headache (page 23)

1. Postpartum patients with headache may be at risk for which condition?

- a. Postpartum preeclampsia
- b. Cerebral venous thrombosis
- c. Postdural puncture headache
- d. All of the above

2. How often is headache present in cases of cerebral venous thrombosis?

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

3. In general, how is postdural puncture headache treated?

- a. Oral analgesics and/or caffeine
- b. Antibiotics
- c. Benzodiazepines
- d. Anti-epileptic drug therapy

Death After Delayed Diagnosis of Acute Epiglottitis in an Adult Patient Initially Seen in Urgent Care: A Case Report (page 31)

1. Which observation is known as “tripoding”?

- a. Patient leans forward to improve airflow
- b. Patient limps and exhibits leg weakness
- c. Abdominal exam demonstrates rigidity, rebound, or guarding
- d. Heart rate increases by a factor of 3

2. What type of assessment can offer important clues to the likelihood of epiglottitis?

- a. Testing for tuberculosis
- b. Testing for SARS-CoV-2
- c. Exam for tenderness of the larynx at the hyoid bone
- d. Exam for tenderness of the sternum and ribs

3. What is the top priority for cases of suspected or confirmed acute epiglottitis?

- a. Airway patency—often by means of endotracheal intubation
- b. Deep tongue blade exam
- c. Pain control
- d. All of the above

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Urgent Care Evaluation and Management of Hip Osteoarthritis

Urgent Message: Osteoarthritis of the hip most commonly affects older adults and those with other risk factors including obesity and prior hip injury. It is a diagnosis of exclusion, therefore, the initial priority in urgent care for patients presenting with hip pain involves excluding alternative, time-sensitive etiologies.

Alex Dragota, BSME; Matthew Baird, MD

Citation: Dragota A, Baird M. Urgent Care Evaluation and Management of Hip Osteoarthritis. *J Urgent Care Med.* 2025; 19(6):15-21

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

Abstract

Oxarthrosis, or osteoarthritis (OA), of the hip is a common condition that can lead to significant pain, decreased mobility, and reduced quality of life. While OA management is typically handled in primary care or orthopedic specialty clinics, urgent care (UC) centers may encounter patients experiencing acute exacerbations or complications related to hip OA. Best practices for the UC management of hip OA prioritizes ruling out more serious diagnoses including, but not limited to, fracture, septic arthritis, and avascular necrosis of the femoral head. The initial imaging study of choice when hip OA is considered is plain hip x-rays (XR) where evidence of arthritic changes, osteophytes, and joint space narrowing can help confirm the diagnosis of OA.

Clinical Scenario

An 80-year-old woman presented to UC complaining of worsening left hip pain, which began insidiously approximately 4 years earlier. She noted that her pain had become worse over the last week without any trauma. Prior to the worsening pain, she reported that she had

Questions for the Clinician at the Bedside

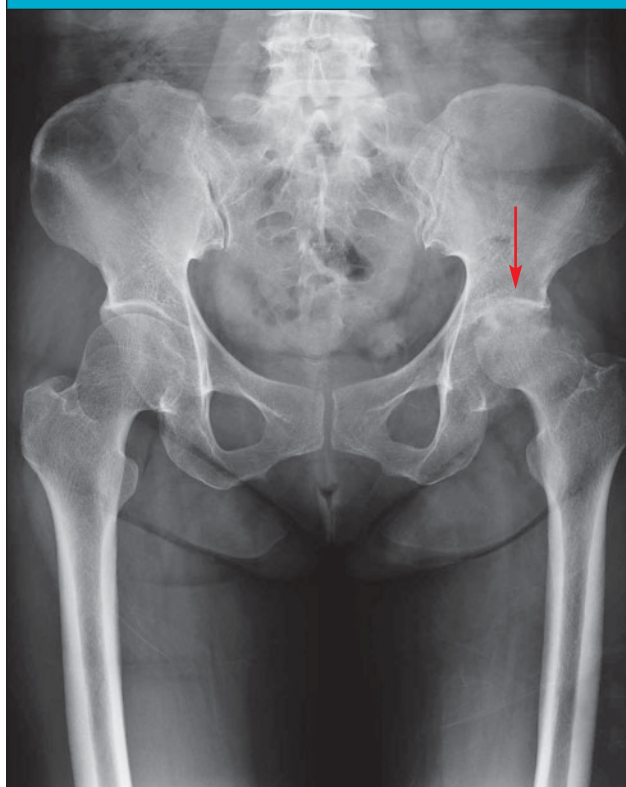
1. Which patients are most likely to develop osteoarthritis (OA) of the hip?
2. What symptoms are most suggestive of OA of the hip?
3. What are the expected physical exam findings of hip OA?
4. Which therapies are effective for hip OA? Which patients should be referred for possible hip arthroplasty?
5. What other conditions should be considered in patients with presumed hip OA?

gone on a walk. She complained of more significant pain when she ranged the hip. She reported taking ibuprofen without much relief. She denied back pain, knee pain, falls, fever, and numbness or paresthesia.

On physical exam, her vital signs were normal. Her abdominal and back exams were unremarkable, and she had no spinal or abdominal tenderness. A focused exam of the area where she was experiencing pain revealed normal appearance of the skin overlying the left hip without overlying erythema, ecchymoses, or swelling. Moderate pain was reported with flexion and extension of the hip as well as with passive internal and external rotation. She reported mild pain with palpation

Author Affiliations: Alex Dragota, BSME, Kentucky College of Osteopathic Medicine. Matthew Baird, MD, University of South Carolina School of Medicine. Authors have no relevant financial relationships with any ineligible companies.

Image 1. X-ray Image of Female Patient With Osteoarthritis of the Left Hip

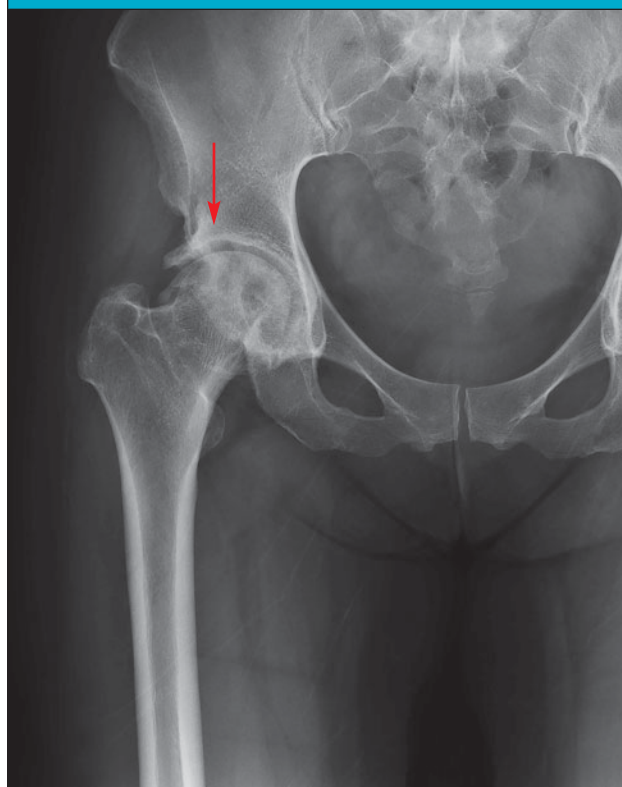


of the greater trochanter on the left. She denied pain with range of motion of the knee, and there was no bony tenderness to the knee. Her neurovascular status was intact with a 2+ dorsalis pedis pulses in both feet and normal sensation to light touch diffusely in both lower extremities. An anterior posterior (AP) radiograph of the pelvis was obtained, which showed arthritic changes in the left hip (**Image 1**).

Epidemiology and Pathophysiology of Hip Osteoarthritis

Osteoarthritis is the most common rheumatic condition worldwide and the leading cause of musculoskeletal disability in developed countries. The hip is one of the most common joints affected by OA^{1,2} with the prevalence being reported as high as 12% in certain regions.³ There are 2 main categories of hip OA: primary/idiopathic; and secondary, which is associated with a known underlying cause.⁴ OA manifests initially as a “molecular derangement (abnormal joint tissue metabolism)” followed by the breakdown of cartilage, changes in bone structure, the formation of osteophytes, and inflammation of the synovial membrane. These pathological processes ultimately lead to joint space narrow-

Image 2. X-ray Image of Female Patient With Osteoarthritis of the Right Hip

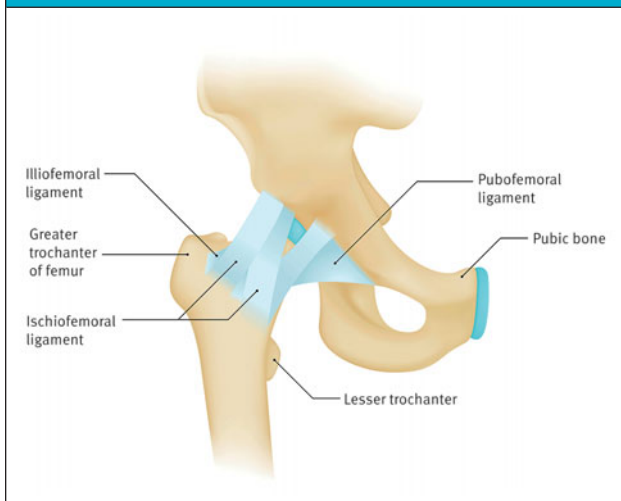
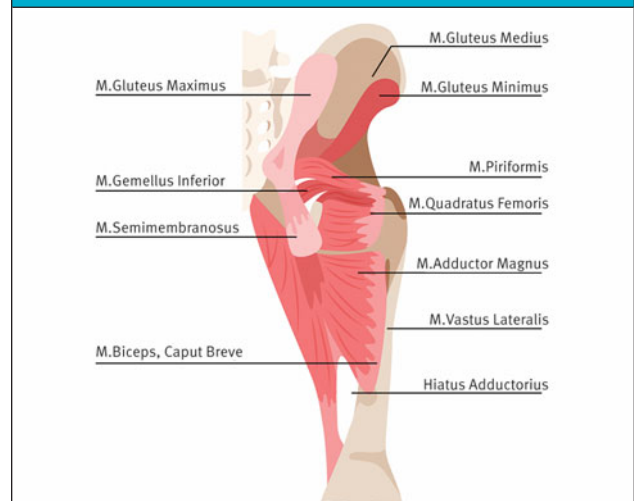


ing and result in symptoms of pain, stiffness, swelling, and functional impairment of the joint (**Image 2**).^{2,5}

Understanding the Anatomy

The pelvis is composed of 3 rings including the large ring of the pelvis, and the 2 smaller rings created by the superior and inferior pubic rami bilaterally. The femoral neck extends proximally to the femoral head, which articulates with the acetabulum of the pelvis as a ball-in-socket joint.⁶ The femoral head is held in place by the strong fibrous labrum that circumferentially lines the acetabulum.⁷ The ligaments of the joint capsule also play a role in stability and include the iliofemoral, pubofemoral, and ischiofemoral ligaments (**Image 3**). Dynamic stability of the pelvis and hips is provided by a variety of muscle groups including the hip flexors (especially the iliopsoas), the gluteal muscles (ie, gluteus medius and maximus, piriformis, quadratus, obturator internus, and the gemelli), and the lateral stabilizers (ie, tensor fascia lata and the iliotibial band complex) (**Image 4**).⁸

The innervation to the hip joint primarily comes from branches of the femoral, obturator, and sciatic

Image 3. Ligaments of the Hip Joint**Image 4. Muscles of the Hip**

nerves. Vascular supply for the hips comes through the medial and lateral circumflex femoral arteries.⁹

Clinical History

Importantly, pain from OA of the hip (ie, femoacetabular) joint often will not be experienced as “hip pain” by patients but rather will localize anteriorly or in the groin. It is rare for hip OA to present with isolated lateral or posterior pain.¹⁰ Radiation of pain into the anterior thigh and knee is also a frequent complaint.¹¹ Hip OA related pain is usually chronic and progressive in nature, however, it can be exacerbated by trauma or repetitive use/activity (which may not seem significant to patients and may even be as simple as light walking). Improvement with rest is also typical for OA related hip pain.¹¹ Patients with hip OA often describe “start-up pain,” or pain and stiffness upon awakening or developing after a period of inactivity, which will improve significantly over 30 minutes after beginning to move.² It is useful to inquire in an open-ended fashion about the patient’s ability to ambulate and how the pain may limit their daily activities.

In addition to exploring the hip pain, other historical features that warrant further assessment include any associated paresthesia, sensation changes or warmth or coolness of the extremity, fevers, vomiting, recent and prior surgeries to the area, and injection drug use (IVDU). The presence of any of these characteristics suggests the possibility of a more ominous etiology and warrant further investigation.

Review the past medical history with a focus on underlying conditions that could increase the likelihood of more serious diagnoses and hence the need for ad-

ditional work-up. Patients with history of instrumentation of the hip (including intraarticular or bursal injection), placement of hardware, or prior arthroplasty warrant thorough exploration of the timeline and outcome of these procedures, especially if performed in the previous 3 months when the risk is greatest (although prosthetic joint infection can occur at any time post-operatively).¹² It is prudent to consult with the patient’s orthopedist in such cases to ensure appropriate immediate evaluation and follow-up. Reviewing prior imaging studies when available can often provide useful clues to the patient’s prior orthopedic history as well.

Special attention should be given to conditions such as diabetes, liver disease, cancer, immunosuppression, and cardiovascular disease. A thorough medication history can provide clues to alternate diagnoses. For example, frequent use of systemic corticosteroids may increase the risk of avascular necrosis (AVN) of the femoral head or septic arthritis due to immunosuppression.¹³ Bisphosphonate therapy can lead to femoral insufficiency fractures.¹⁴ IVDU dramatically increases the risk of spinal infections and septic arthritis, which both may present with hip pain.¹⁵

Finally, it is worthwhile to review any past imaging studies available and any prior therapies the patient has tried, including arthroscopic surgeries and intra-articular injections—which may not be radiographically evident on XR.

Physical Examination

Review the patient’s vital signs. Fever, hypotension, and/or significant tachycardia warrant further exploration. Ensure the most accurate temperature measure-

ment technique available in patients with hip pain if they report subjective fevers. Before focusing on the area of the patient's pain, a screening examination of the abdomen and back is important to avoid missing sources of referred pain. Document the patient's general appearance and ability to ambulate.

The physical exam of the hip should include the 5 pillars of any musculoskeletal assessment:

1. Inspection
2. Palpation
3. Range of motion (ROM)
4. Strength
5. Neurovascular status

Passively range the hip in a progressive fashion. A log roll of the entire leg with the patient supine and knee extended is a gentle first examination. Significant pain with log roll suggests such patients will often not tolerate more aggressive passive ROM.¹⁶ Inspect and palpate for skin changes such as erythema, ecchymosis, abrasions, lacerations, fluctuance, necrosis, or crepitus. Palpate for location of pain, but do not be surprised if patients are non-tender. The highest yield findings on physical exam will be limitations to active ROM (especially internal rotation and adduction), and pain with passive ROM (especially flexion and internal rotation).^{17,18} Note which active movements exacerbate pain such as walking or twisting.

To evaluate the neurovascular status, palpate the femoral pulse in the groin, and assess the skin color and temperature of the leg, noting any pallor or coolness. Additionally, check capillary refill in the foot and note any swelling as well as the location of the leg affected. Sensation can be screened by lightly touching different areas of the leg and foot and comparing the sensation to the contralateral lower extremity. Check patellar and ankle jerk reflexes bilaterally. Inquire about any pain radiating down the leg, which could indicate nerve compression. An examination of the lumbar spine should be performed in non-traumatic hip pain patients routinely, as referred pain and radicular pain can often manifest as hip pain. The straight leg raise (SLR) test is a sensitive test for lumbar disc herniation (ie, sciatica) etiologies of pain, whereas the crossed SLR is insensitive but >90% specific.¹⁹

Differential Diagnosis

Most of the diagnoses listed can be ruled out with a thorough history and physical exam. Differential diagnosis includes:

- Traumatic or pathologic fracture
- Septic arthritis

- Crystal arthropathy (ie, gout, calcium pyrophosphate disease)
- Inflammatory arthritis (ie, rheumatoid arthritis)
- Avascular necrosis of the femoral head (Legg-Calvé-Perthes disease in young children)
- Apophyseal avulsion fracture
- Overuse/strain
- Transient synovitis
- Trochanteric bursitis
- Radicular pain or referred pain from the lumbar spine, abdomen, pelvis etc.
- Malignancy

Diagnostic Testing

Blood laboratory testing is rarely helpful unless there is clinical suspicion for infection. While white blood cell count and inflammatory markers (ie, sedimentation rate and c-reactive protein) are sensitive for excluding infection, these are highly non-specific, and false positives are common.²⁰ As these tests rarely affect UC management or disposition, it is prudent to forgo such testing, especially when results will not be quickly available. Plain radiography is the initial test of choice. A standard hip XR includes an AP view (with internal rotation) and a lateral view (cross-table or frog-leg). Proper positioning is key: in the AP view, the greater and lesser trochanters should be visible, with minimal femoral head-neck overlap. Avoid excessive external or internal rotation to prevent joint space width (JSW) measurement errors. Lesquesne's view (false profile) can assess anterior joint space and early OA. Avoid switching views in longitudinal studies to ensure consistency. In obese patients, supine positioning may improve image quality.²¹

AP hip XR will typically reveal arthritic changes in the hip, but clinical correlation is important. The radiographic appearance of OA of the hip involves joint space narrowing (especially to the superior aspect of the joint), osteophytes, and subchondral sclerosis along the acetabular rim and femoral head.^{1,2} The diagnosis of hip OA requires XR findings with suggestive symptoms typical of arthritis such as groin pain, joint stiffness, and limited range of motion. Advanced imaging is generally not required. Many patients have radiographic findings without any symptoms, and there is poor correlation with XR findings and severity of symptoms.^{2,22}

There are 3 established techniques for radiographic assessment of hip OA which differ in reliability. These 3 methods are: minimum JSW measurement; Kellgren and Lawrence (KL) grading system; and Croft grading system. The JSW method quantitatively measures the

narrowest space between the femoral head and acetabulum with a width of <2.0 millimeters indicating OA. This objective measurement leads to high reproducibility and interobserver agreement.²³ In contrast, the KL and Croft grading systems rely on qualitative assessments of radiographic features like osteophytes, joint space narrowing, and bone deformities, resulting in moderate interobserver variability due to differences in interpretation. JSW measurement is more suitable for clinical practice because of its simplicity and higher reliability. The KL and Croft systems can serve as supplementary tools when evaluating severe cases of OA.²³

Indications for Referral to the Emergency Department

Consider the following for referral to the emergency department (ED):

- Concern for hip fracture (ie, inability to bear weight)
- Intractable pain
- Concern for septic arthritis
- Consideration of an alternative time-sensitive diagnosis

Management of Hip Osteoarthritis In Urgent Care

As always, the initial responsibility of the UC provider in evaluating a patient with presumed hip OA is to consider alternative conditions that require timely intervention to prevent adverse outcomes. Such diagnoses include occult fractures, septic arthritis, and malignancy. In the setting of trauma, plain radiographs can miss between 2% and 9% of hip fractures.²⁴ Plain radiographs can also fail to detect AVN in 38-59% of cases.^{25,26} If clinical suspicion is high (ie, a previously ambulatory patient who is now unable to bear weight), advanced imaging should be obtained prior to discharge or permitting weight bearing. As this is often not possible in UC settings, ED referral is appropriate in such cases to allow for timely access to cross-sectional imaging. Magnetic resonance imaging (MRI) of the hip serves as the gold standard for evaluation of occult fracture. Computed tomography (CT) of the hip is a second line option if MRI is unavailable. CT, however, can also miss fractures with a sensitivity of 86-94%.^{27,28,29}

Infection and malignancy should be considered in patients with measured or reported fevers and/or the presence of red flag risk factors including: immunosuppression, prior septic joint, active/metastatic cancer, severe pain at rest, unexplained weight loss, IVUDU, advanced liver disease, rheumatoid arthritis or other autoimmune conditions, and poorly controlled diabetes. If patients report 1 or more of these risk factors,

and there is clinical concern, immediate referral to the ED is recommended.^{30,31}

After reasonably excluding alternate, time sensitive diagnoses, it is appropriate to begin treatment for OA in cases with supporting history and XR findings. The initial treatment of OA of the hip focuses on symptom relief. By the time symptoms of hip OA manifest, significant joint damage has usually occurred, and conservative treatments should be expected to offer only moderate and temporary relief.³² Disease-modifying interventions remain elusive, and total hip arthroplasty (THA) is ultimately required in advanced cases.^{32,33}

“The initial treatment of OA of the hip focuses on symptom relief. By the time symptoms of hip OA manifest, significant joint damage has usually occurred, and conservative treatments should be expected to offer only moderate and temporary relief.”

Current best practice for management of pain related to hip OA begins with progression from conservative non-pharmacological methods to pharmacological treatments, and finally referral to an orthopedist to review surgical options.

The most effective non-pharmacological options for patients with hip OA to improve quality of life involve a personalized approach integrating patient education, tailored exercise programs, physical therapy, and weight loss in patients who are overweight or obese.^{2,5,34,35,36} Additionally, the use of walking aids, appropriate footwear, and adaptations of home or work environment can reduce pain and enhance daily function.^{34,35} Physical therapy referral in those with mild to moderate OA is recommended by the American Academy of Orthopedic Surgeons (AAOS).³⁶

Initial pharmacological management strategies that can be initiated in the UC setting should focus on the patient's acute symptoms. Oral non-steroidal anti-inflammatory drugs (NSAIDs) in patients are generally effective and well-tolerated for short courses without contraindications. Reasonable options for NSAID ther-

apy include diclofenac 100 mg daily, ibuprofen 800 mg 3 times daily, or naproxen 500mg twice daily. NSAIDs have been shown to improve function and reduce opioid use in patients with OA.^{37,38} Topical NSAIDs have shown efficacy in treating pain associated with OA of the hands and knees, but their use has not been shown to be effective for analgesia in patients with hip OA.^{5,37,38} This is thought to be attributable to the relatively greater distance from the skin to the hip joint.⁵ For individuals with contraindications to oral NSAIDs, acetaminophen, up to 3,000mg daily, can be used, although has been shown to be slightly less effective. Such doses of acetaminophen can also be safely added to an NSAID regimen and may offer some additional relief for hip OA pain.⁵

In UC settings with appropriate sterile equipment and with adequate clinician training, intraarticular (IA) glucocorticoid injections can be performed with direct image guidance, typically via ultrasound or fluoroscopy.³⁷ IA glucocorticoids have been shown to improve pain and function when used in combination with standard care³⁹ and receive a moderate level recommendation by the AAOS. Patients receiving IA corticosteroid injections should be counseled about possible risks, including infection and rapid progression of OA in rare cases.^{37,38} More commonly, UC clinicians will be referring patients for consideration for IA corticosteroid injections, and awareness of this therapeutic option is important in settings where there may be system or patient barriers to THA.

Other oral and IA therapies have been studied for OA of the hip and have unfortunately largely proven ineffective. Specifically, strong recommendations against IA hyaluronic acid,³⁷ IA botulinum toxin, methotrexate, hydroxychloroquine, chondroitin sulfate and glucosamine and bisphosphonates exist due to lack of supporting evidence.⁵

Next Level Urgent Care Pearls

- A diagnosis of OA of the hip requires evaluation of suggestive symptoms, exam findings, and XR findings.
- Findings suggestive of hip OA on XR include joint space narrowing, osteophytes, and subchondral sclerosis.
- Initial management strategies involve non-pharmacologic interventions including physical therapy, weight loss, and core strengthening exercises. Pharmacologic interventions include oral acetaminophen and NSAIDs.
- Do not defer specialist referrals. Given the chronic

and progressive nature of hip OA, immediate physical therapy, weight management, and orthopedic surgery referrals are all reasonable and appropriate once the diagnosis is confirmed.

- Intraarticular steroid injections may be helpful for certain patients while awaiting arthroplasty.

Red Flags and Legal Pitfalls

- Consider the possibility of hip fracture (even with minimal or no trauma history) malignancy, and septic arthritis. If these are suspected, transport the patient to the ED for further evaluation.
- Consider septic arthritis in patients acute hip pain and risk factors such as poorly controlled diabetes, IVDU, and/or immunosuppression. Do not rely on absence of a measured fever in high-risk patients.
- Plain AP pelvis XR is the initial imaging study of choice for patients presenting with hip pain. Importantly, normal XR should not be relied upon to exclude serious diagnoses, namely hip fractures, especially if the patient newly is unable to bear weight.
- MRI is the gold standard for excluding occult hip fractures. CT may be more readily available, however, a negative CT cannot be used to exclude hip fracture.

Clinical Scenario Conclusion

The patient was given acetaminophen and instructed to use occasional naproxen for more significant pain. A physical therapy referral was placed, and the importance of weight loss was reviewed. She was referred to an orthopedic surgeon for discussion of the risks and benefits of THA. The patient ultimately decided to pursue surgical management and regained full use of her hip. She experienced resolution of her pain after surgical recovery and rehabilitation.

Takeaway Points

- OA of the hip most commonly affects older adults and those with other risk factors including obesity and prior hip injury.
- The most common symptoms of hip OA include groin or hip pain that worsens with activity, stiffness after inactivity, reduced ROM and/or a grinding sensation with movement.
- Physical examination may reveal limited hip mobility, pain with active and passive ROM, crepitus, joint tenderness, muscle weakness, and altered gait.
- Effective non-surgical treatments for hip OA include physical therapy, appropriate strengthening

exercises, medications, and IA corticosteroid injections. Hip arthroplasty is the definitive treatment and generally results in dramatic improvement or resolution of symptoms.

- Hip OA is a diagnosis of exclusion. The most important initial priority in UC for patients presenting with new or worsening hip pain involves excluding alternative, time-sensitive etiologies for hip pain such as fracture, infection, malignancy, and referral from spinal or visceral pathology. ■

Manuscript submitted January 19, 2025; accepted February 6, 2025.

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Postpartum Presentations: When Risk Arises After Delivery – Headache

Urgent Message: Both common and serious postpartum conditions may present in urgent care. Headache presentations should prompt consideration for possible postpartum preeclampsia, cerebral venous thrombosis, or post-dural puncture headache.

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Citation: Bailey A, Kostandaras L, Poorman H, Weinstock M, Neal C. Postpartum Presentations: When Risk Arises after Delivery – Headache. *J Urgent Care Med.* 2025; 19(6):23-30

Key Words: headache, postpartum, preeclampsia, post-dural puncture headache, cerebral venous thrombosis, CVT

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

Abstract

Background: The postpartum period introduces a broader range of possible diagnoses for common complaints seen in urgent care (UC).

Aim: The aim of this review is to enhance clinician familiarity with the diagnosis and management of both common and life-threatening postpartum conditions that may present in the UC setting. This article focuses on headache during the postpartum period.

Conclusion: In addition to the common etiologies of headache, it is important for UC clinicians to consider postpartum preeclampsia (PP); cerebral venous thrombosis (CVT); and post-dural puncture headache (PDPH).

Background

The postpartum period is variably defined and ranges



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Table 1. Postpartum Preeclampsia	
Exam	Associated Findings
Cardiopulmonary	• Gallop heart rhythm (eg, S₃, S₄) • Tachycardia • Rales • Wheezes • Peripheral edema
Neurologic	• Altered sensorium • Diminished visual acuity • Visual field deficits • Focal motor deficits • Hyperreflexia • Clonus

from 6 weeks to 6 months after delivery.^{1,2} However, the majority of physiologic change and risk is limited to the first 6 weeks postpartum.² Women experience a variety of symptoms and physiologic changes in the weeks following childbirth. Differentiating expected postpartum signs and symptoms from pathologic conditions can be challenging for both patients (especially first-time mothers) and clinicians.³ However, understanding the conditions for which women are at risk after delivery is a critical first step for clinicians.

Given that postpartum symptomology may be related to anything from benign physiologic changes to life-threatening conditions, it is important for UC clinicians to appropriately balance reassurance and vigilance. Assessment begins with a detailed history and focused physical exam. Vigilance should be exercised while considering and evaluating for serious pathologies. Reassurance becomes clinically indicated after these have been excluded.⁴

The case scenario presented in this review is hypothetical but illustrates various postpartum complaints and associated differential diagnoses to provide guidance for UC evaluation and disposition.

Hypothetical Clinical Scenario

A 36-year-old G2P2 (2 pregnancies, 2 live births) woman presented to UC with her husband 6 days after giving birth to a healthy infant by cesarean delivery (c-section) without complication. She presented with a chief complaint of 2 days of a gradual onset headache that was associated with blurred vision. She reported trying acetaminophen at home without relief.

On exam, her vitals were normal except for a blood pressure (BP) of 148/92 mmHg. She was sitting upright on the table holding her head during the exam and appeared generally uncomfortable. Her cardiopulmonary exam revealed clear lungs and normal heart rate and rhythm. Her abdomen was soft, non-tender, and her

incision was intact, dry, and without surrounding erythema. Her uterus was firm, nontender, and palpable just below the umbilicus. Her neurologic exam was unremarkable, and specifically her extraocular movements and the remainder of the cranial nerve exam were normal. Her visual fields were intact bilaterally to confrontation. Her reflexes were brisk and symmetric, but there was no inducible ankle clonus.

Headache

Headaches are a common complaint in UC, and the vast majority of headache presentations are related to primary headache disorders (eg, migraine, tension, etc.) and benign.⁵ However, there are additional causes of headache which are unique to the postpartum period, such as preeclampsia and CVT.⁶ In an effort to address maternal mortality in the United States, the Centers for Disease Control (CDC) and Prevention's Division of Reproductive Health launched a national campaign called "Hear Her" to raise awareness of urgent warning signs of serious conditions during both during pregnancy and the first year postpartum.⁷ This campaign continues to create materials and resources to raise awareness for these issues among healthcare professionals in the fields of obstetrics, pediatrics, emergency medicine, and primary care.⁷

Postpartum Preeclampsia

Epidemiology and Pathophysiology

Preeclampsia is a leading cause of maternal morbidity and mortality, with an incidence of up to 12% antenatally and 1.5% in the postpartum period.⁸ It is likely that this underestimates the true incidence of PP, however, because milder cases may be missed or miscategorized as hypertension.⁹ Experts still are uncertain as to whether isolated PP is caused by the same pathologic processes as antepartum preeclampsia, and work in this area continues.⁹

The most significant risk factors for PP are having preeclampsia or another hypertensive disorder antenatally or during a prior pregnancy, age >35 years, obesity, delivery by c-section, and non-Hispanic Black race.¹⁰ Unlike antepartum preeclampsia, PP does not appear to be more common among primiparous women.¹¹ Patients who have a c-section have a 2-7-fold increased risk of PP compared to those who deliver vaginally.¹² Patients who receive greater volumes of intravenous (IV) fluids infusions during hospitalization have an increased risk of PP as well.¹² Since IV fluid administration volumes tend to be greater in women undergoing c-section, this may account for the some of the increased associated risk.

History

The most common presenting complaint in women who have PP is headache, which may range from mild to severe.⁹ Other symptoms may include changes in sensorium and confusion, vision changes, and focal neurologic deficits. If seizures occur, the condition is then classified as postpartum eclampsia.¹³ Symptoms due to volume overload and uncontrolled hypertension such as dyspnea, chest pain, orthopnea, and peripheral edema may also be present.⁹ Importantly, a patient's headache response (or lack thereof) to any analgesic agent does not affect the likelihood of preeclampsia.⁹ While the onset of headache is often gradual, patients with PP are at risk for intracranial hemorrhage and may have sudden onset/thunderclap headache presentation as well.¹⁴

Exam

The physical exam should include a thorough cardiopulmonary and neurologic assessment (**Table 1**).⁹

Testing

If considering PP, it is important that the recommended laboratory test results are available during the patient's visit. When this is not practical in the UC setting, immediate emergency department (ED) referral is indicated. The American College of Obstetricians and Gynecologists (ACOG) recommends the following laboratory tests be obtained:¹⁵

- Complete blood count
- Basic metabolic panel
- Spot urine protein
- Liver function

ACOG subdivides preeclampsia into those with or without severe features.¹⁵ However, whether severe features are present or not, it is usually appropriate to refer patients to the ED or labor and delivery triage immediately if any of the criteria are met (**Table 2, 3**). Preeclampsia requires a gestational age of at least 20 weeks, and the criteria for different severities are the same in PP as well.¹⁶ In the UC setting, it is not advisable to wait 4 hours between blood pressure measurements for patients who otherwise meet criteria for either category of preeclampsia.

Initial Management

In patients presenting with only an elevated blood pressure reading but no other criteria for preeclampsia, lowering the blood pressure is the priority.¹⁷ ACOG recommends treating women with sustained, severe hypertension ($\geq 160/110$ mmHg) with rapid-acting anti-

hypertensive agents, preferably through IV administration within 30-60 minutes.⁹ Agents used for management of acute, severe hypertension in the postpartum period are similar to those used during pregnancy and include IV labetalol, hydralazine, and nicardipine. Oral nifedipine is given as an alternative option in settings where there is no IV access.^{9,18} Magnesium sulfate is also recommended, either intramuscularly or IV, for seizure prophylaxis in patients with clinical suspicion for preeclampsia with severe features,¹⁹ while acknowledging that this recommendation is based on low-quality evidence.²⁰ Postpartum eclampsia and PP most commonly occur within the first 2-7 days after delivery; the vasodilatory effect of magnesium is thought to decrease peripheral vascular resistance and help protect the blood-brain barrier.²¹

Indications for Referral to Emergency Department

As patients with concern for PP require close BP monitoring, and IV anti-hypertensive agents and magnesium therapy, all postpartum patients with features of preeclampsia should be referred immediately to the nearest ED or obstetric labor and delivery unit.⁹

It is advisable that patients being referred for evaluation and management of suspected preeclampsia do not drive themselves. In patients with reliable transportation, a normal neurologic exam, and no headache, having a family member drive them to the ED is reasonable. However, ambulance transport may be required for patients lacking immediate, reliable transportation or those exhibiting severe features.

Cerebral Venous Thrombosis

Epidemiology and Pathophysiology

Patients experience a transient hypercoagulable state during the later stages of pregnancy and in the postpartum period; this leads to increased risk for venous thromboembolism (VTE), including CVT.¹¹ In the United States, 6% of all cases of CVT occur either during pregnancy or in the postpartum period.^{11,15}

CVT can lead to cerebral ischemia and stroke-like symptoms. However, unlike arterial thrombotic and embolic cerebrovascular accidents (CVA)—which typically affect older patients with vascular risk factors—CVT occurs more commonly in young adults, particularly women.²² Additional risk factors for CVT in the postpartum period include comorbid preeclampsia, thrombophilia disorders (eg, antiphospholipid antibody syndrome, Factor V Leiden, etc.), homocystinuria, and sepsis.^{18,22} In-hospital mortality for patients diagnosed with CVT is approximately 2% and 9% at 1 year. Older

Table 2. Preeclampsia With Severe Features ¹²	
Severely elevated blood pressure	Systolic blood pressure (SBP) ≥ 160 mmHg <i>and/or</i> Diastolic blood pressure (DBP) ≥ 110 mmHg on 2 occasions at least 4 hours apart while the patient is on bedrest
Symptoms of central nervous system dysfunction	New-onset cerebral or visual disturbances including: • Flashes in vision, scotomata, cortical blindness/vision loss, retinal vasospasm <i>and/or</i> • Severe headache or headache that persists and progresses despite analgesic therapy with acetaminophen and not accounted for by alternative diagnoses
Hepatic abnormality	Elevated transaminases not accounted for by another diagnosis with values >2 times the upper limit of the normal range <i>and/or</i> Severe, persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by an alternative diagnosis
Thrombocytopenia	Platelet count $<100,000/\mu\text{L}$
Kidney function impairment	Serum creatinine >1.1 mg/dL <i>and/or</i> Doubling of the serum creatinine concentration in the absence of other causes of renal impairment

Table 3. Preeclampsia Without Severe Features ¹²	
Elevated blood pressure	SBP ≥ 140 mmHg <i>and/or</i> DBP ≥ 90 mmHg on at least 2 occasions at least 4 hours apart within 6 weeks of delivery
New onset of 1 or more of the following:	• Proteinuria – $\geq 0.3\text{g}$ (300mg) in a 24-hour urine – Urine dipstick reading of $\geq 2+$ <i>or</i> – Protein/creatinine ratio of ≥ 0.3 (30 mg/mmol) in a random urine specimen • Platelet count $<100,000/\mu\text{L}$ • Serum creatinine >1.1 mg/dL <i>or</i> doubling of the creatinine concentration in the absence of other kidney disease • Liver transaminases at least twice the upper limit of normal concentrations for the local laboratory • Pulmonary edema • New-onset and persistent headache not accounted for by alternative diagnoses and not responding to usual dose of analgesics • Visual symptoms (eg, blurred vision, flashing lights or sparks, scotomata)

age, active malignancy, and presence of associated seizures or intracranial hemorrhage are associated with higher mortality at 30 days and 1 year.²³

History

Headache is the most common presenting symptom in patients with CVT and is present in nearly 90% of cases.²⁴ The headache pattern in CVT is typically described as generalized and gradual in onset, progressing in severity over days to weeks. While not the most common pat-

tern, a non-trivial minority of patients with CVT experience a sudden onset, or “thunderclap,” headache.²⁵ Neurologic deficits and seizures may also be present in patients with CVT, although they occur in the minority of patients and are relatively late findings.²⁶ When present, the most common neurologic signs are hemiparesis, aphasia, and visual field deficits. Other cortical signs and sensory symptoms may occur; one-third of patients experience associated seizures.^{22,27} Coma at presentation relatively rare occurring in 9-20% of cases.²⁶

Exam

In approximately 40% of patients with CVT, the physical exam is normal.²⁸ While evident in the minority of cases, the presence of papilledema, scalp edema, and dilated scalp and neck veins, if seen on exam, should prompt consideration of CVT.¹¹ On neurologic exam, hemianopia, hemiparesis (contralateral to the CVT), and/or aphasia may be seen in 30-40% of cases.¹¹

Testing

Postpartum patients presenting with acute headache and new neurological signs warrant emergent brain imaging. While computed tomography (CT) and magnetic resonance imaging (MRI) are rarely available in UC settings, it is important for clinicians to understand appropriate testing when CVT is of concern to ensure rapid referral to a facility with appropriate resources.

CT without contrast is often non-diagnostic for CVT but may demonstrate secondary findings suggestive of CVT.²⁹ Anatomic variability of the venous sinuses makes non-contrast CT insensitive for CVT, with a normal CT exam reported in approximately 70% of cases.³⁰ In the ED, specific additional brain imaging studies are often suggested in consultation with a neurologist or radiologist.³¹

If there is clinical concern for CVT, the American College of Radiology (ACR) states that either CT or magnetic resonance venography (MRV) are appropriate imaging studies and similarly sensitive for the diagnosis of CVT.^{10,18,32}

Diagnostic Criteria

D-dimer has been explored as a screening test for CVT. However, in contrast to screening for pulmonary embolism (PE) and deep vein thrombosis (DVT), d-dimer has not proven to be sufficiently sensitive to exclude CVT.³³

The diagnosis of CVT relies on cross-sectional neuroimaging findings. Per the ACR Appropriateness Criteria, either MRI or CT venography are acceptable for excluding CVT and have sensitivities ranging from 95-100%. CVT can be diagnosed when suggestive findings are present using either modality of venography.^{10,28,34}

Initial Management

The long-term management of CVT depends on many patient factors as well as the presence and severity of any associated deficits.³⁵ The mainstay of acute treatment is parenteral anticoagulation with either unfractionated or low-molecular weight heparin and parenteral anticonvulsant therapy if seizures occur.³⁶

After initial parenteral anticoagulation, the ongoing management of CVT involves a variable additional

period of anticoagulation with either warfarin or a direct oral anticoagulant. Anticoagulation duration can be as little as 3–6 months in provoked CVT to potentially life-long anticoagulation in recurrent CVT, VTE following CVT, or CVT associated with severe thrombophilias.³⁶

“Any postpartum patients with a new, acute and/or severe headache without an alternate explanation and concern for CVT should be immediately referred to an ED; the patient should not drive herself in these situations.”

Immediate management of seizures in postpartum patients does not differ from management of seizures in the general population. Initial treatment involves parenteral use of benzodiazepines at appropriate doses (eg, lorazepam, midazolam etc).³⁷ In cases where there is any possibility of eclampsia, empiric IV magnesium is also recommended, as it is common to have limited history in such clinical scenarios.³⁷ The appropriateness/necessity of long-term anti-epileptic drug therapy in the setting of seizures associated with a new diagnosis of CVT will be an individualized decision made by the treating neurologist.³⁸

Indications for Referral to Emergency Department

Any postpartum patients with a new, acute and/or severe headache without an alternate explanation and concern for CVT should be immediately referred to an ED; the patient should not drive herself in these situations. If neurologic signs or symptoms or seizures are present, EMS activation is recommended for ambulance transport. In postpartum patients without severe headache and neurologic deficits but low-moderate pre-test probability for CVT, an urgent outpatient CT or MRV obtained within 24 hours is a reasonable strategy; such an outpatient plan also requires communication of strict precautions for seeking care in the nearest ED if symptoms progress *and* another responsible adult present who can monitor their status.

Post-Dural Puncture Headache**Epidemiology and Pathophysiology**

Epidural anesthesia is used in 30-60% of vaginal deliveries in the developed world.³⁹ While not an intended

outcome, accidental dural puncture occurs as a complication in approximately 1% of cases of intrapartum epidural anesthesia.⁴⁰ Among these patients, a post-dural puncture headache will occur in up to 80% of cases.^{41,42} In contrast, post-dural puncture headaches occur in 0.8-6% of cases utilizing spinal anesthesia (eg, c-section).⁴³

Headaches after dural puncture are related to cerebrospinal fluid (CSF) leak at the puncture site, which results in intracranial hypotension.⁴⁴ PDPH typically present within the first 5 days after the procedure with peak incidence in the first 24-72 hours.⁴⁵

“PDPH is treated symptomatically. If discomfort is non-debilitating, the symptoms can be managed with oral analgesics and/or caffeine (which helps stimulate cerebrospinal fluid production).”

History

The most suggestive distinguishing factor for PDPH is a postural change in headache severity—the headache will typically improve significantly when the patient is supine and worsen with standing.⁴⁴ Other associated symptoms may include neck stiffness, hearing changes, tinnitus, neck pain, back pain, visual disturbances/changes, vertigo, and nausea.⁴⁵

Exam

A thorough head/neck and neurological exam is important to evaluate for other more sinister causes of headache (eg, meningitis, subarachnoid hemorrhage). Examine the lower back at the puncture site, specifically noting signs of infection or evidence of CSF leakage.⁴⁴

Testing

PDPH is a clinical diagnosis. In cases when a brain MRI is obtained to rule out other etiologies of headache, 1 or more findings may be present such as caudal displacement of the brain, subdural hygroma, pachymeningeal enhancement due to increased venous flow, and/or expansion of the pituitary gland.⁴³ Labs are not helpful in the evaluation of PDPH.

Diagnostic Criteria

The International Classification of Headache Disorders, third edition defines a PDPH as occurring within the past 5 days and strongly orthostatic in nature. The diagnosis is also predicated on exclusion of other causes of headache based on other associated symptoms and spontaneous resolution or improvement after a blood-patch procedure.⁴⁴

Brief Management

PDPH is treated symptomatically. If discomfort is non-debilitating, the symptoms can be managed with oral analgesics and/or caffeine (which helps stimulate cerebrospinal fluid production).^{43,44} Patients with an intractable headache after dural puncture can be treated with an epidural blood patch, typically placed by an anesthesiologist.⁴³

Indications for Referral to Emergency Department

A postpartum patient with headache in whom PDPH is suspected clinically warrants ED referral if the pain and intolerance of standing is debilitating and conservative treatments have failed.⁴⁴ Such patients are those in whom blood patch is typically offered. It is important to confirm the availability of anesthesiology services at the hospital the patient is being referred to as this is the specialist who will generally perform a blood patch. Blood patch improves not only immediate symptomatology but also seems to reduce the risk of chronic headache in patients with PDPH.⁴⁶

Patients with concerning neurologic symptoms or symptoms suggestive of alternative diagnoses that may require neuroimaging also warrant immediate ED referral. Ambulance transport is prudent if time-sensitive diagnoses are in the differential and/or the possibility of clinical deterioration exists (eg, CVA, meningitis). Signs of visible CSF leak or infection at the puncture site are also findings that should prompt immediate ED referral.

Other Causes of Headache

In addition to causes of headache unique to the postpartum period, patients may also experience primary headaches (eg, tension, migraine, etc.) or other types of secondary headache (eg, meningitis, sinusitis, neck artery dissection, post-traumatic etc.). The list of differential diagnoses for postpartum headache presentations, therefore, should also include any etiology that might otherwise explain the headache in addition to the diagnoses discussed in this review.

Clinical Scenario Conclusion

In UC, the patient's BP was elevated to >140/90 mmHg. She was allowed to sit quietly in a dark room for 15 minutes, and her BP measurement was repeated. Her BP remained elevated in a similar range. The UC clinician checked a urine dipstick which showed only 1+ protein and no other abnormalities. Given concerns for PP with her persistently elevated BP and headache, the UC clinician called the patient's obstetrician (OB/GYN) who recommended sending her to the ED as immediate lab testing was not available in the UC center. The patient declined ambulance transport, and her husband drove her instead. The UC clinician called the ED and provided a sign-out and summary of her care to the emergency physician on shift.

In the ED, the patient's BP remained elevated, and IV labetalol was started. Her lab testing did not reveal any severe features, and therefore she was not treated with magnesium prophylaxis. She was admitted to the OB/GYN unit and discharged the following day on oral anti-hypertensive agents with instructions to continue to monitor BP at home and follow-up in 2 days.

Summary and Key Points for Urgent Care Providers

- While most headaches presenting to UC are due to a benign etiology, postpartum patients are at risk for specific conditions, namely PP, CVT, and PDPH, which require separate consideration as there may be increased morbidity in cases of delayed diagnosis.
- Postpartum patients are at the highest risk for PP and CVT in the first week after delivery with the risk decreasing over time until approximately 6 weeks postpartum.
- While an elevated BP may be related to pain, in the postpartum period, this should not be presumed until PP is excluded. It is important to recognize that what would in other scenarios be considered mild and non-emergent levels of BP elevation (ie, >140/90 mmHg) would represent an emergency/PP until proven otherwise in patients presenting in the days and weeks after pregnancy.
- High risk signs and symptoms for each respective condition include:
 - **Postpartum preeclampsia**—gradual onset and often severe headache with elevated blood pressure readings; may also have associated vision changes, altered mental status, right upper quadrant or epigastric pain, dyspnea, and peripheral edema. Seizures may occur in severe cases.
 - **Cerebral venous thrombosis**—generalized, progressive headache with stroke-like symptoms in-

cluding focal neurological deficits like hemiparesis, aphasia. Seizures and coma may occur in severe cases.

- **Postdural puncture headache**—postural headache that is worse with standing; may have associated neck stiffness or back pain up to 5 days after epidural anesthesia.

“The list of differential diagnoses for postpartum headache presentations, therefore, should also include any etiology that might otherwise explain the headache in addition to the diagnoses discussed in this review.”

- Refer postpartum patients to the ED immediately if presenting with a new, severe headache, neurologic deficit, seizure, alteration in sensorium or if BP is elevated. Also refer if there is concern for preeclampsia when laboratory testing and/or neuroimaging is not immediately available in the UC setting.
- Post-dural puncture headaches can be managed symptomatically. Most will resolve without procedural intervention, however, an epidural blood patch may be required to achieve analgesia in those who are unresponsive to conservative therapy. ■

Manuscript submitted December 3, 2024; accepted February 2, 2025.

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Death After Delayed Diagnosis of Acute Epiglottitis in an Adult Patient Initially Seen in Urgent Care: A Case Report

Urgent Message: Epiglottitis is a potentially fatal condition that has undergone a changing etiology in the post-Hib vaccine landscape. Urgent care providers should be well versed on its presentation to properly triage patients and avoid misdiagnosis.

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Citation: Bradley W. Death After Delayed Diagnosis of Acute Epiglottitis in an Adult Patient Initially Seen in Urgent Care: A Case Report. *J Urgent Care Med.* 2025; 19(6):31-35.

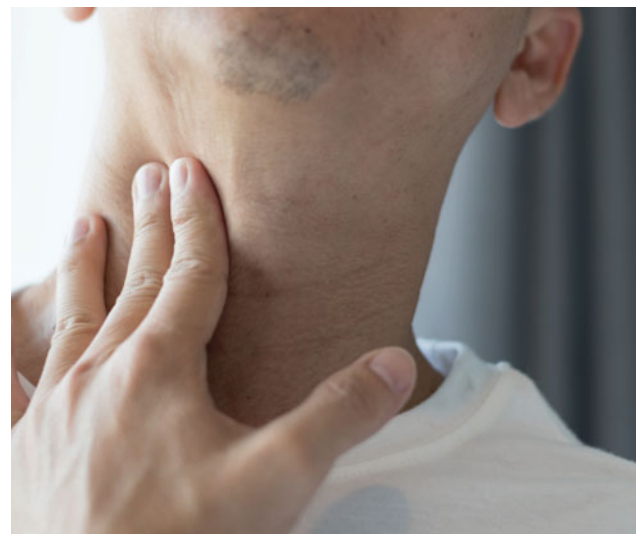
Key words: sore throat, epiglottitis, thumbprint sign
Abstract

Introduction: Acute epiglottitis is a potentially fatal condition which can progress rapidly to result in occlusion of the upper airway. Incidence of epiglottitis has decreased and shifted from children to adults after the widespread adoption of *Haemophilus influenzae* type B (Hib) vaccine. Early symptoms of epiglottitis may mimic more benign diagnoses, such as pharyngitis, which are much more commonly seen in urgent care (UC) settings.

Case Presentation: A 44-year-old man presented to a UC center with 2 days of worsening sore throat and painful swallowing.

Physical Exam: Physical exam findings revealed erythematous tonsils and posterior erythema of the oropharynx.

Case Resolution: The patient was diagnosed with acute nasopharyngitis at the initial UC visit and discharged



home. The next day, the patient had a sudden cardiac arrest while en route to the local emergency department (ED); he was not able to be resuscitated. Post-mortem examination revealed airway occlusion and respiratory failure secondary to acute bacterial epiglottitis.

Conclusion: While the incidence of acute epiglottitis has declined and shifted to a disease more commonly seen among adults over recent decades, it remains an important consideration for patients with sore throat.

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Affected patients are at risk for rapidly progressive swelling, which can result in fatal airway occlusion.

Introduction

Acute epiglottitis is a potentially fatal condition caused by a bacterial or viral infection, which can result in significant airway obstruction. Before the introduction of the *Haemophilus influenzae* vaccine in 1985, acute epiglottitis was largely considered a disease of childhood.^{1,2} However, since the widespread implementation of the *Haemophilus influenzae* type B (Hib) vaccine, the incidence of pediatric epiglottitis has decreased dramatically.² A 15 year retrospective Danish study found that within 2 years of the Hib vaccine's introduction into the standard pediatric immunization regimen, cases of acute epiglottitis had reduced by 72%.³ Today the *Streptococcus* species is the principal causative agent with the *Staphylococcus* species in the second position.⁴ Adults are at greater risk of fatal cases of epiglottitis with 63.5% of epiglottitis deaths occurring in those over age 18.⁵

Epiglottitis occurs when exudate from inflammation in the lingual tonsils spreads to the lingual surface of the epiglottis, triggering the swelling that is characteristic of acute epiglottitis.⁶ Rich networks of blood and lymphatic vessels on the lingual surface of the epiglottis cause this area to be particularly susceptible to inflammation.⁶

Accurate and timely identification remains the best route to epiglottitis diagnosis and management.

Case Presentation

A 44-year-old man with a history of hypertension and current tobacco use presented to urgent care with 2 days of worsening sore throat and painful swallowing. He also reported fever, nasal congestion, and post-nasal drip. He denied rash, nausea, cough, chills, pain in and around ear, and eye discharge or redness. His vaccination history, particularly regarding receipt of Hib vaccine, was not known. Additionally, his travel history was unknown.

Physical Exam Findings

The patient's vital signs were: blood pressure of 164/99 mm/Hg; heart rate of 109 beats per minute; respiratory rate of 16 breaths per minute; temperature of 37.5°C (99.6°F); and oxygen saturation of 93% on room air. The patient was noted by the UC clinician to be drooling and having difficulty speaking. He seemed to be in some distress secondary to painful swallowing and speech. Later deposition by the patient's wife revealed

that he was unable to lie down supine without distress. Neck/thyroid inspection was unremarkable.

Visualized portions of the oropharynx revealed erythema of the tonsils without exudate. Examination of the neck revealed anterior cervical lymphadenopathy. His lungs were clear with equal breath sounds, and he was tachycardic with a regular rhythm.

Urgent Care Management

The UC clinician obtained a rapid group A streptococcal (GAS) test, which was negative. The patient was given a presumptive diagnosis of acute nasopharyngitis and was prescribed an oral prednisone burst and azithromycin for the significant odynophagia he was experiencing. The patient was advised to see his primary care provider if his symptoms did not improve after 1 week. If symptoms worsened, the patient was advised to go to the ED or return to urgent care.

Case Continuation and Conclusion

The day after his UC visit, the patient's throat pain continued to worsen. He felt increasingly unwell, and he was taken to the ED by his wife. Unfortunately, the patient collapsed in the parking lot before entering the hospital. The patient was found to be in cardiac arrest when hospital staff responded. Cardiopulmonary resuscitation was initiated. In the ED, the emergency physician attempting intubation documented an enlarged and erythematous epiglottis seen on video laryngoscopy.

Despite all efforts to resuscitate the patient, he did not survive the event. An autopsy was performed with the medical examiner noting a bacterial infection of the entire supraglottic larynx, including severe purulence of the epiglottis with an aryepiglottic abscess. The cause of the patient's death was deemed to be a result of acute hypoxemic respiratory failure due to airway obstruction from acute bacterial epiglottitis.

Discussion

Although the incidence of epiglottitis has been declining since the advent of the Hib vaccine, the condition still occurs. A retrospective analysis of United States mortality trends related to acute epiglottitis since the introduction of the Hib vaccine revealed that the number of attributable deaths in adults has fallen from 65 in 1979 to 15 in 2017.⁵ During this study period, males were affected more frequently, accounting for 69.1% and 64.1% of the fatal cases in adults and adolescents respectively.⁵ Males between 42 and 48 years are the most frequently affected group.²

While cases may vary based on disease severity and

duration of illness, patients will commonly have multiple characteristic symptoms. Taken from a 2010 and 2021 retrospective review of 3 tertiary medical centers, the signs and symptoms of epiglottitis are reported in **Table 1**.^{7,8}

Tripoding (ie, assuming a leaning forward position to relieve pain and airway obstruction) is rarely observed in modern cases of adults with epiglottitis, however, it is a highly concerning finding if observed.⁹ Some patients with acute epiglottitis may lack posterior pharyngeal erythema and have a relatively normal appearing throat. In such cases where odynophagia is noted to be out of proportion to oropharyngeal visual inspection findings, the presence of tenderness with palpation/manipulation of the larynx at the hyoid bone is a finding which should raise concern for epiglottitis.¹⁰

When a diagnosis of bacterial epiglottitis is made, immediate parenteral antibiotic therapy is indicated. Third-generation cephalosporins or extended spectrum penicillin, as well as vancomycin for methicillin-resistant *Staphylococcus aureus* (MRSA) should be administered.⁴ Levofloxacin can be substituted for those with penicillin allergies. For cases with suspected *Pseudomonas aeruginosa* infection, cefepime or piperacillin-tazobactam can be used.⁴

One retrospective study found that patients treated with corticosteroids had a significantly decreased intensive care unit stay (1.7 days compared to 4 days, $p=0.0153$).⁷ However, a small sample size ($n=27$ and $n=11$) draws into question the validity of these results.

A rapid GAS test was performed at the initial UC visit in the case presented. Despite the negative result, the patient was placed on oral azithromycin and prednisone, which would not be indicated with the presumptive diagnosis given at the initial visit. Furthermore, the patient's decompensation despite oral antibiotics and corticosteroids underscores the importance of timely recognition of epiglottitis. Clues to a more serious diagnosis than a simple nasopharyngitis that were not further pursued by the UC clinician include the severity of the patient's pain, difficulty speaking, and difficulty swallowing secretions/drooling. Additionally, the patient may have not been immunized with the Hib vaccine, which may have also contributed to his risk. However, no pathogen was isolated given his precipitous deterioration and demise. While patients who did not receive the complete Hib immunization series may be at increased risk of epiglottitis, adequate vaccination does not exclude the possibility of epiglottitis, especially in adults.¹¹

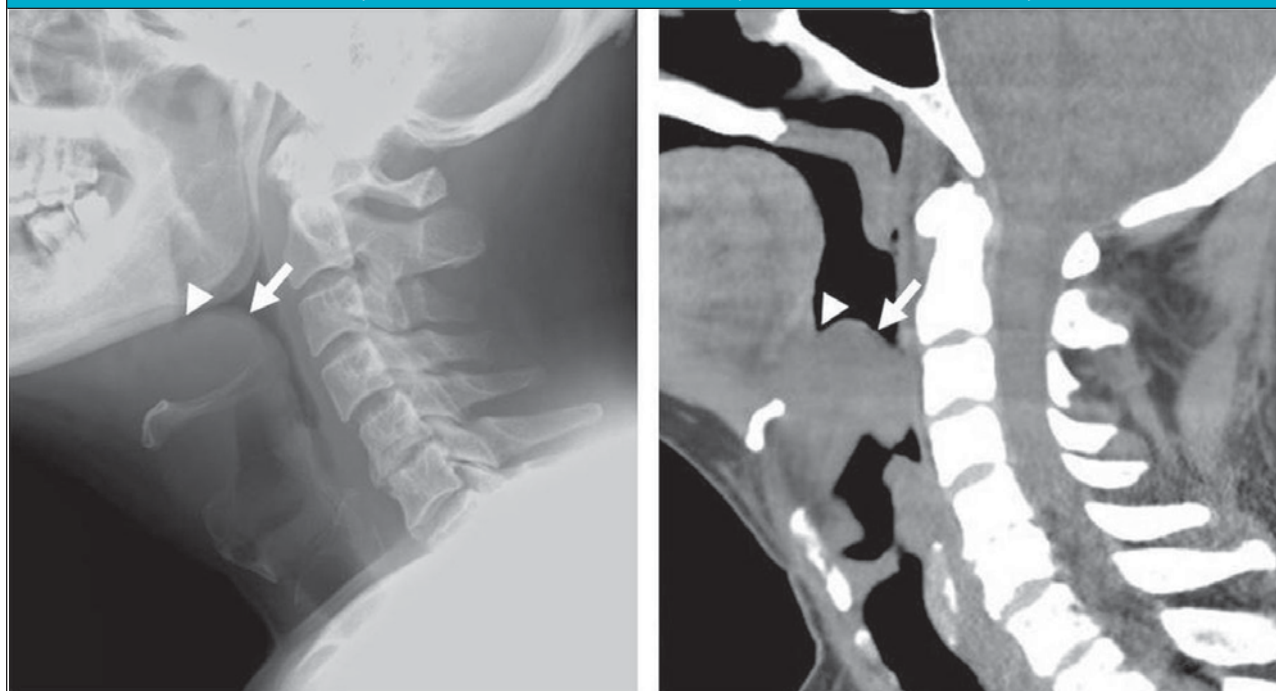
Early signs and symptoms of acute epiglottitis overlap

Table 1. Epiglottitis Symptoms and Signs^{7,8}

Symptoms and Signs	Percentage
Dysphagia	47.1% - 85%
Odynophagia	45.7% - 100%
Voice Changes	38.6% - 75%
Drooling	17.1% - 39%
Fever During Hospitalization	15.9%
Stridor	13% - 13.1%
Fever on Presentation	12.9%
Trismus Noted	5% - 9.1%
Tripod Position	5%

with those of many common self-limited conditions frequently seen in UC. However, because early recognition of epiglottitis is critical for preventing poor outcomes, as the patient in this case experienced, concerning findings during the initial assessment must not be overlooked. At the patient's initial presentation, there were several clinical clues to the presence of a more serious diagnosis than simple viral pharyngitis. The UC clinician noted that the patient had voice changes and drooling, which are atypical for viral pharyngitis and more suggestive of etiologies that can progress to airway compromise such as peritonsillar abscess, retropharyngeal abscess, and epiglottitis.¹²

The gold standard for diagnosis of acute epiglottitis is visualization of an inflamed and enlarged epiglottis on direct or video laryngoscopy.^{4,8} A presumptive diagnosis, however, is often arrived upon prior to laryngoscopy based on a combination of clinical and/or imaging findings. Lateral neck radiography can demonstrate enlargement of the epiglottis seen as the distinctive "thumbprint sign" (**Figure 1**).⁷ While highly suggestive of the diagnosis, 1 retrospective study found that the "thumbprint sign" is not seen in approximately 23% of presentations¹³; the subjective nature of this finding and its frequent absence early in the disease course functionally limit its clinical utility. Given the "can't miss" nature of epiglottitis, finding a more quantitative and sensitive radiographic indicator is important. Computed tomography (CT) of the neck with contrast has nearly 100% sensitivity for the diagnosis of epiglottitis¹⁴ but is rarely immediately available in UC settings. In a 2018 study, Kim et al. suggested radiographic criteria to enhance the sensitivity of plain x-ray (XR) in the diagnosis of epiglottitis. These authors explored test characteristics for the measurements of the widths of the epiglottic base, epiglottic tip, aryepiglottic fold, and hypo-

Figure 1. Lateral Neck Radiograph Showing Characteristic 'Thumbprint Sign' Suggestive of Epiglottitis

pharynx with the dimensions of the retropharyngeal and retro-tracheal tissues.¹⁵ Measurements of the epiglottic width at the base was found to have the best characteristics with a sensitivity of 96.2% and specificity 98.2% with a threshold of 5.02mm.¹⁵ However, it is important to note that this criterion was retrospectively derived and has not been prospectively validated.

In cases of suspected or confirmed acute epiglottitis, ensuring airway patency is the top priority, often by means of endotracheal intubation. In a meta-analysis of airway management outcomes in over 10,000 adult epiglottitis cases between 1980 and 2020, the overall rate of endotracheal intubation was 10.2%.¹⁶ Additionally, between 2-3% of cases were found to require surgical airway management in a large, retrospective Chinese study.¹⁷ History of diabetes and stridor have been shown to be predictive factors for an increased risk for requiring airway intervention.¹⁸

Given that invasive airway management maneuvers are not feasible in the UC setting, patients with signs or symptoms strongly suggestive of acute epiglottitis should be immediately transferred to an ED by emergency medical services (EMS). Radiography in UC should not be ordered as it unnecessarily delays EMS activation and transfer to a facility capable of advanced airway interventions. Deep tongue blade exam or other instrumentation of the posterior oropharynx should be avoided in

such cases as it may hasten airway compromise.⁴

In cases where clinical suspicion is present but low, it is generally appropriate to obtain soft tissue neck radiographs in UC. If there are suggestive findings of epiglottitis on lateral neck XR (eg, “thumbprint sign” or widening of the base of the epiglottis) and/or progression of symptoms during the patients UC course, EMS activation is indicated.

Ethics Statement

Patient was unable to be contacted due to the outcome of the case, therefore certain demographics and details of the case have been changed to protect patient anonymity and confidentiality.

Key Takeaway Points for Urgent Care Clinicians

- In the post-Hib vaccine era, acute epiglottitis is more commonly a disease of adults.
- Patients with acute epiglottitis may have a relatively normal appearing posterior oropharynx. Assessing for tenderness of the larynx at the hyoid bone can offer additional clues to the likelihood of epiglottitis in such cases.
- Voice changes, stridor, trismus, tripodding, and drooling are concerning signs for cases of throat pain, which have higher risk for airway compromise.
- Acute epiglottitis can progress rapidly and result in

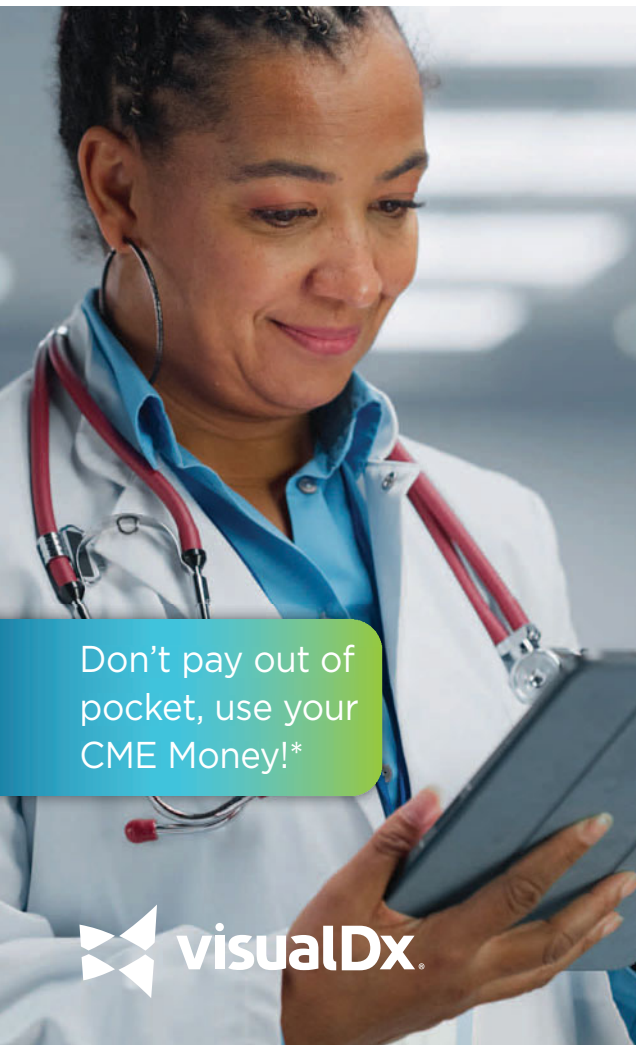
airway occlusion, making early recognition and ED referral from UC critical for mitigating the risk of catastrophic outcomes.

- EMS activation in cases of moderate-high suspicion for epiglottitis should not be delayed for the purposes of obtaining neck XR imaging from UC. ■

Manuscript submitted November 16, 2024; accepted January 30, 2025.

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Shorter Visits Drive Greater Patient Satisfaction in Urgent Care

Urgent Message: Urgent care has long marketed itself as providing immediate care for acutely rising conditions, and true to this reputation, an analysis of clinical and administrative variables in electronic medical records shows the greatest predictor of patient satisfaction is visit duration.

Alan A. Ayers, MBA, MAcc

Citation: Ayers AA. Shorter Visits Drive Greater Patient Satisfaction in Urgent Care. *J Urgent Care Med.* 2025; 19(6):37-43

As a retail delivery channel, urgent care depends on future repeat visits and viral word-of-mouth recommendations from satisfied patients, including positive online reviews and social media mentions. That's why many urgent care centers evaluate the quality and effectiveness of their patient experience in terms of each patient's "likelihood to recommend."

The formal methodology is net promoter score (NPS), which is calculated by asking patients on a scale of 0-10 how likely they are to recommend a service—with higher scores indicating greater customer loyalty and positive perception of the brand. One benefit of NPS is that scores can be compared across industries or to leading brands, from Tesla and Apple to CVS to Kaiser Permanente.

When discussing NPS, 2 metrics are considered. First is the average response to the question: "Based on today's visit, how likely are you on a scale of 0 to 10 to recommend this urgent care?"

The second metric considers the distribution of responses as follows:

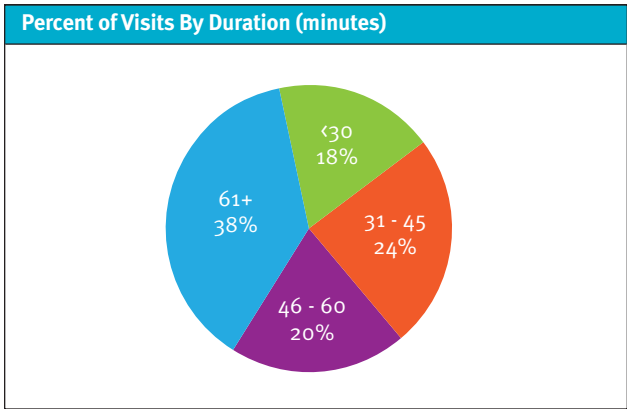
- 9s and 10s are classified as "promoters" because patients are indicating a strong likelihood to recommend the service. These are the loyal fans of a business who want to see it succeed and consider it their "go to" in time of need.



- 7s and 8s are "neutrals," thrown out from the calculation because they're "lukewarm" patients only loyal to the extent they don't come across a better option.
- 0-6s are "detractors," meaning dissatisfied patients with a high likelihood of speaking negatively about their experience. Lower numbers are associated with greater vitriol, which can manifest in negative online reviews, complaints to the medical board, and credit card chargebacks. Detractors seek "jus-

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Little to No Correlation with NPS
• Visits with Radiology • Visits with a Referral • Number of Procedure Codes per Visit • Percent of Visits with a Lab
Some Correlation with NPS
• Percent of Visits with a Prescription • E/M Level of Service • Provider Credentials
Strong Correlation with NPS
• Percent of Labs Performed In-House • Average Visit Duration (negative correlation)



“tice” by actively undermining a business. Service recovery efforts can “neutralize” detractors, if not turn them into promoters.

Applying this framework, NPS is literally the net of promoters over detractors—equal to the percentage of promoters (9s and 10s) minus the percentage of detractors (0s to 6s). Results are reported both as an average of the 1-10 scores and/or combined into a single number between -100 and +100 with higher numbers being better.

A review of nearly 33 million aggregated patient records in Experity’s Electronic Medical Record system from 2024 indicates a nationwide urgent care net promoter score of 84 based on an average survey response of 9.4. This article seeks to identify the datapoints in patient records that are predictive of NPS to demonstrate where to focus patient experience efforts.

Clinical Care Weak Predictor of NPS

Although correlation is not causation, the data seems to indicate that urgent care patients expect to get in and out in less than an hour, receiving their lab tests on-site, and leaving with a prescription.

The complexity of the medical decision making (reflected in the evaluation and management [E/M] level of service) and the number of procedure codes billed per visit do not materially drive NPS. Neither do situations in which a patient receives x-rays or referrals to other providers. One assumption may be that a baseline standard of care occurs across all visits—thus reducing variance among these clinical variables—which leaves wait times to be the primary determinant of NPS.

When a patient must wait for reference lab results—particularly for sexually transmitted infections (STIs)—and also wait for a prescription, the act of leaving urgent care with unresolved issues may lead to a lower evaluation than if they had received a diagnosis and treatment on the spot.

Average Visit Duration Strong Predictor of NPS

The single greatest correlation among the variables studied is the visit duration, defined as the time lapse between check-in and discharge. Variance in visit duration explains almost half of the variance in NPS. The average visit duration nationally is 59.6 minutes, which indicates urgent care generally embraces patient expectations of “in and out in less than an hour.” The correlation is negative in that an increase in wait times results in a decrease in NPS.

The chart above shows the percent of visits of various time ranges. Note 42% of patients are in and out in under 45 minutes, while 62% are in and out in an hour or less. Per the table below, visits greater than 60 minutes are associated with greater clinical decision-making.

E/M Level of Service

Evaluation and management (E/M) coding recognizes 4 types of medical decision making: straight-forward; low complexity; moderate complexity; and high complexity. And these 4 types are used across 5 levels of service in outpatient visits. It appears as the complexity of the visit increases, so does NPS—with the exception being service level 5. This is counterintuitive because visit duration likewise increases with the level of service. So, 1 conclusion may be that patients are more tolerant of wait time if they feel it’s associated with a higher

Visit E/M Level	Average Visit Duration (minutes)	NPS	Average Visit NPS
1	54	82	9.29
2	56	83	9.31
3	59	84	9.40
4	63	87	9.50
5	70	77	9.07

Average Daily Visits	Average Visit Duration	NPS	Average Visit NPS	Average Daily Visit Count
<19	55	90	9.6	11
20-29	54	86	9.5	24
30-39	58	84	9.4	35
40-49	60	83	9.3	43
50-59	53	91	9.7	50
60-69	63	81	9.3	63
>70	55	83	9.3	82

level of service.

A level 5 service level indicates a patient with a complex medical situation, multiple chronic illnesses with severe exacerbations, or an acute life-threatening condition. A level 5 visit usually involves a longer consultation with the patient to discuss treatment options and potential risks. It may involve the time-consuming administration of oxygen or IV fluids, for example. Because visit duration is negatively correlated to NPS, the longer time required for a level 5 is likely why it results in a lower NPS.

Number of Visits Per Day

Providers in an urgent care setting typically have a capacity of 4 patients per hour or 1 every 15 minutes. In a busy clinic, the arrival of patients can be compared to an assembly line with which providers have to keep pace. We can assume that a provider with surplus capacity who is seeing only 2-3 patients per hour (24-36 over a 12 hour shift) will be less stressed and less likely to “fall behind” on patient throughput and thus get patients in and out more quickly.

The data confirms that as average daily visits increase, visit duration increases, and NPS falls. That is, until the center reaches 50 visits per day, which is typically the point a second provider is added. With a second provider added after 50 patients, NPS jumps as average visit duration falls.

The fall in NPS when reaching greater than 60 patients is likely due to increasing utilization of both providers. It's important to note that only 15% of centers see greater than 50 patients per day on average, so as volume goes up, the sample size decreases. It can be assumed a high volume center can attribute its success to above average service.

Seasonality

Urgent care is a seasonal business, driven primarily by respiratory conditions in the winter months. When staffing remains constant, increased volumes should

result in longer waits and thus lower NPS. In both 2023 and 2024, there was an early, 4th quarter “quademic” (influenza, COVID, respiratory syncytial virus, and strep) that resulted in higher-than-average volumes. However, despite seeing a higher proportion of visits in the 4th quarter, there was little variance in NPS. Rather, NPS remained steady across quarters.

Credentials of Rendering Provider

Urgent care patients may be examined, diagnosed, and treated by a nurse practitioner, physician assistant, or physician. While the data indicates only 14.9% of 2024 urgent care visits were rendered by DO or MD physicians, visits delivered by a physician did receive higher average scores. While one might conclude that a physician brings a more authoritative bedside manner or greater efficiency in medical decision making due to more extensive training, whether a physician or advanced practice clinician is seeing patients is based on multiple other factors involving the clinic's ownership and operating model (individual vs hospital vs private equity), which can affect all the other variables impacting scores.

Payer Type

Urgent care centers typically bill insurance, including commercial plans and government programs like Medicare, Medicaid, and TRICARE. Being in-network means the urgent care is contracted and credentialed with a payer, is listed in payer directories, and accepts “assignment” of the insurance payment in full, subject to patient responsibility like co-pays, co-insurance, and

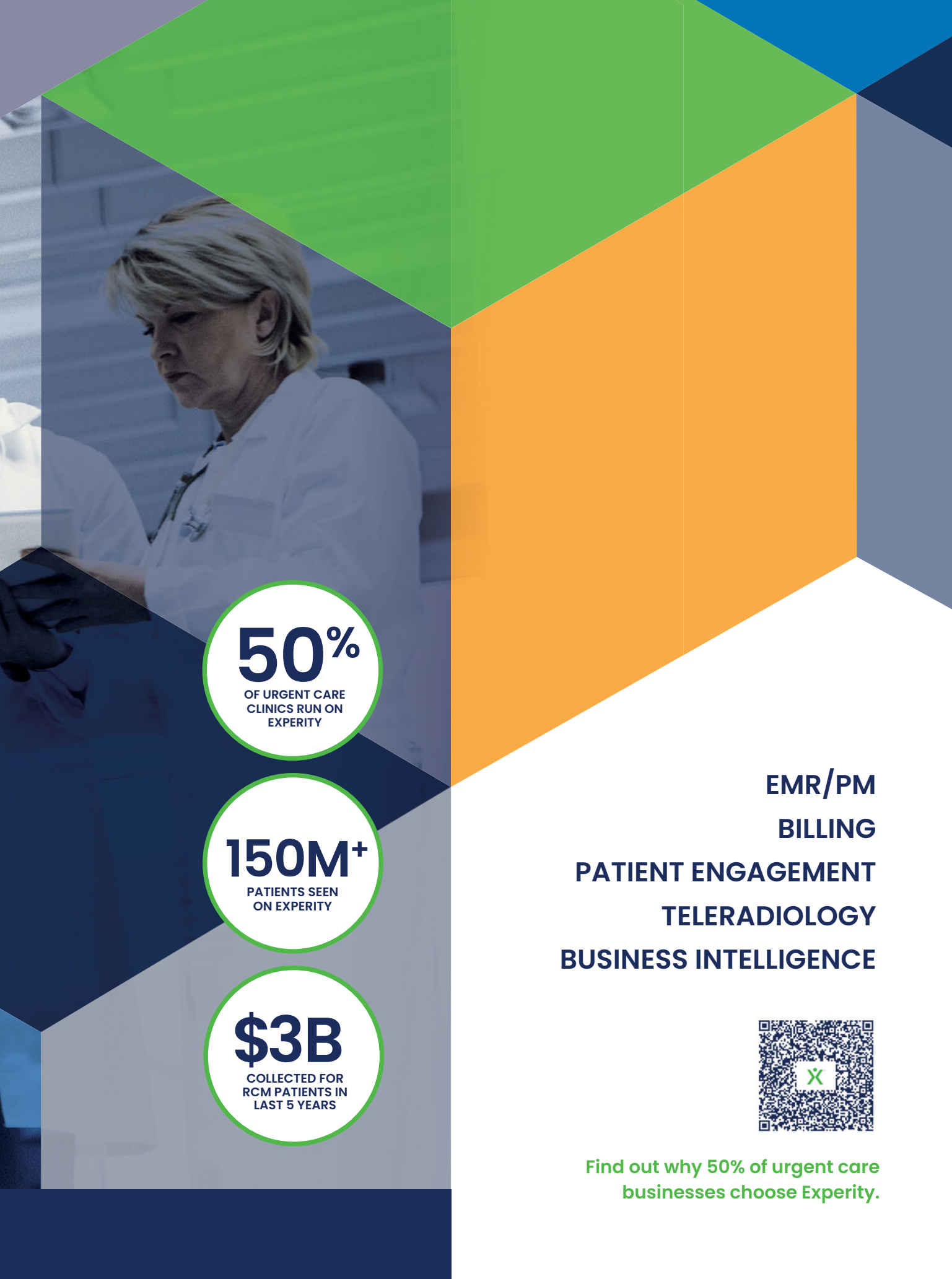
Seasonality of Urgent Care				
	Q1	Q2	Q3	Q4
NPS	85	84	84	83
Average Visit NPS	9.4	9.4	9.4	9.4
Percent of Yearly Visits	25%	23%	24%	27%
2023 and 2024				

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Rendering Provider Type	NPS	Average Visit NPS
Nurse Practitioner	83	9.3
Physician Assistant	83	9.2
DO or MD Physician	90	9.5

Payer	NPS	Average Visit NPS
BUCA*	85	9.4
Medicare	92	9.7
Medicaid	85	9.4
Tricare	86	9.5
Self-Pay	85	9.4

*Blue Cross/Blue Shield, United Healthcare, Cigna, and Aetna.

Visit Type	Average Visit NPS	NPS	Percent of Visits
Employer-Paid	9.3	82	7%
Miscellaneous	9.4	84	4%
Private	9.4	85	86%
Workers' Compensation	9.2	79	3%

deductibles. Some patients choose to pay cash. The patient's insurance is generally not a determinant of NPS except for Medicare.

“Regarding patient age, NPS bottoms out when a patient is in their 20s but then increases after age 30.”

Visit Type

A visit may be for a personal illness or injury (private), employer-paid services (EPS) like drug screens and physicals, or for workers' compensation handling a job-related injury.

Unlike a private visit in which the patient chooses to utilize the urgent care on their own, workers' compensation care is typically directed by an employer, entails multiple visits, and entails decisions involving causation, time off work, light or modified duty, and extent of long-term disability. Distinguished from “private,” the “miscellaneous” category is a catch-all for non-provider visits like immunizations and blood pressure checks.

A greater number of detractors are found in occupa-

Patient Sex at Birth	NPS	Average Visit NPS	Percent of Patients
Female	85	9.4	57%
Male	85	9.4	43%

Patient Sexual Orientation	Average Visit NPS	NPS
Lesbian, Gay, or Homosexual	9.7	92
Patient Declines	9.5	88
Straight or Heterosexual	9.5	87
Unknown	9.4	85

Patient Race	Average Visit NPS	NPS	Percent of Patients
White Including Hispanic	9.5	87	71%
Black or African American	9.4	84	17%
Other or Multiple	9.3	82	7%
Asian	9.2	78	3%
American Indian, Native Hawaiian, or Alaska Native	9.4	85	1%

tional medicine visits, which may reflect that patients don't care for this type of employer-directed care because they didn't choose it themselves or that patients who disagree with findings of a drug screen or work restriction determination are expressing this dissatisfaction in their score.

Age, Sex, Sexual Orientation, and Race

An ongoing concern for healthcare professionals is identifying and addressing inequities in health care delivery. “Health equity” is the concept that everybody, regardless of circumstances, has a fair and just opportunity to attain their highest level of health.¹

Interestingly, there is not only difference in NPS reported by patient sex, but those who self-identify as “lesbian, gay, or homosexual” report a higher NPS than those who identify as “straight or heterosexual.”

When sorting by patient self-identified race, the highest NPS is among White (including Hispanic) patients, while Black or African-American and Native American patients report slightly less satisfaction. The lowest NPS by race is among patients who identify as Asian.

Differences in NPS by race could perhaps be attributed to historic past disparities in health care and health outcomes.²

Last, regarding patient age, NPS bottoms out when a patient is in their 20s but then increases after age 30.

Patient Age (years)	NPS	Average Visit NPS
0-6	82	9.3
7-12	85	9.4
13-18	84	9.4
19-29	74	9.0
30-39	81	9.2
40-49	84	9.4
50-59	87	9.5
60-69	90	9.6
70+	90	9.6

This is perhaps because Gen Z has greater impatience with waiting than older generations.³ For patients younger than age 18, the survey is most likely completed by the Millennial or Gen X parent or guardian.

Intangibles

Considering the factors that drive NPS, still more than half of NPS is likely determined by non-quantifiable “intangibles.” Online reviews frequently cite “rude” staff or providers who “didn’t listen to my concerns,” but short of asking patients directly, it’s nearly impossible to measure patients’ perceptions of the friendliness

or competence of providers and staff. An overall focus on patient experience is more than getting patients in and out quickly but entails consideration of process, systems, facility, policies, pricing, and every other element of the service.

Conclusion

As a retail healthcare delivery channel, success in urgent care is dependent on providing patient experiences resulting in positive reviews and word-of-mouth referrals. To achieve a higher NPS score, the data indicates there’s little more urgent care operators can actively do than focus on reducing door-to-door time while identifying the intangibles that differentiate the brand and cultivate positive emotions with patients. ■

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ABSTRACTS IN URGENT CARE

Developing Procedural Mastery With Slit Lamp Use

Take Home Point: Simulation-based mastery learning (SBML) intervention improved emergency physicians' confidence in performing and teaching slit lamp exams (SLE) to other clinicians, but this confidence waned after completing the training.

Citation: Hamou S, Ghiaee S, Chung C, et. al. Emergency Department Slit Lamp Interdisciplinary Training Via Longitudinal Assessment in Medical Practice. *West J Emerg Med.* 2024;25(5):725-734. doi: 10.5811/westjem.18514

Relevance: Procedural comfort and competence for a wide variety of minor procedures is a core aspect of urgent care (UC) and emergency medicine (EM) practice. Increasingly simulation-based training is being implemented to ensure standardized exposure for trainees in a controlled, low-stakes setting.

Study Summary: This was a multicentered project using the conceptual frameworks of the mastery learning model and rapid cycle deliberate practice (RCDP) to ensure proficiency among emergency physicians (EP) in performing a comprehensive SLE. The authors enrolled 15 EPs from an urban academic medical center in Philadelphia, Pennsylvania. The multidisciplinary research team created a longitudinal procedural curriculum that involved online and in-person training on SLE use and ability to identify pathology. The efficacy of the training was evaluated using the 4 levels of the Kirkpatrick model: improved learner confidence (level 1); knowledge acquisition (level 2); willingness of learners to incorporate their skillset in clinical practice (level 3); and ability to teach the content to learners (level 4). The participants' proficiency (via standardized examination) and confidence were both measured before beginning the program (Time 1), immediately upon completion (Time 2), and two months after completing the program (Time 3).

The participating EPs had nearly 8 years of post-clinical training experience. 73% of the participating EPs reported

never or rarely performing SLEs before the training and only 20% felt confident in their slit lamp ability. After completing the SLE curriculum, there was a statistically significant improvement in 8 of 20 domains of slit lamp use tested. These included tasks such as sanitizing the chin and forehead rest before the exam and positioning the light source at 45 degrees to examine the anterior chamber. Immediately after completing the training (Time 2), the proportion of EPs who felt confident performing a comprehensive SLE was 87% and 73% felt more confident in teaching residents how to perform a SLE. The number of learners reporting that they were "very confident" or "extremely confident" in performing and teaching the SLE increased from Time 0-1, but then decreased from Time 1-2 (ie, 60 days after completing the course). There was no change in use of ophthalmology consultations between pre- and post-training surveys.

Editor's Comments: Availability of slit lamps in UC centers is highly variable. Currently, very few UC centers in the U.S. have a slit lamp, whereas the New Zealand "Urgent Care Standard" requires all UC centers to have the equipment. Both cost and clinician proficiency are major factors which influence an UC center's decision to acquire a slit lamp.

With the average slit lamp device costing between \$5,000-10,000 USD, equipping America's nearly 15,000 existing UC centers would cost over \$75 million USD. Because there is no unique billing (ie, CPT) code for a SLE, it is highly unlikely that the slit lamp will become part of standard equipment in U.S. UC centers until the economics of the situation change in a meaningful way.

In the hands of an appropriately trained clinician, the slit lamp is certainly a valuable piece of diagnostic technology and part of a standard, comprehensive eye exam. However, this study suggests that even residency trained EPs with an average of nearly a decade of post-graduate training mostly lacked proficiency and confidence in appropriate slit lamp without significant additional training. In recent years (and again for largely economic reasons) we have seen the UC work force in U.S. increasingly move towards advanced practice providers (APPs) with increasingly less prior independent clinical experience. The EPs in this study improved their confidence after investing considerable time in the simulation training, but the training was intensive, and their confidence waned within just a few months of completing the training.

Specialists and emergency clinicians frequently express concerns over the lack of specialized equipment of all vari-



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eties in UC centers. However, the ability of UC centers to provide high-value care relies on limiting investments in costly technology, especially those that are rarely used. For those who wish to continue to argue the necessity of ubiquitously available slit lamps, this study does little to support their argument. For instance, the EPs need for ophthalmology expertise was not affected by the training. Ultimately, data demonstrating that UC slit lamp use in a real-world setting either significantly reduces serious negative outcomes for patients or generates sufficient revenue to offset the costs of purchase, maintenance, and clinician training will be required to justify a change in the status quo. ■

Are We Overdiagnosing Pediatric Pneumonia?

Take Home Point: Emergency physicians (EPs) diagnosed pediatric ED patients with pneumonia nearly three times more frequently than a consensus panel who retrospectively arbitrated each case. The EPs, however, missed only 1 case of bacterial pneumonia. Cough >5 days in duration and nasal flaring were the only non-laboratory clinical findings predictive of pneumonia. However, many exclusion criteria and low rates of enrollment significantly undermine interpretability of this study's results.

Citation: Robinson J, Kellner J, Crotts J, et. al. Accuracy of the Diagnosis of Pneumonia In Canadian Pediatric Emergency Departments: A Prospective Cohort Study. *PLoS One*. 2024 Dec 11;19(12): e0311201. doi: 10.1371/journal.pone.0311201

Relevance: Pneumonia in children is relatively common, and is more commonly viral in etiology than in adult patients. Determining which pediatric patients with pneumonia are likely to have a bacterial etiology is important for preventing adverse outcomes, while avoiding unnecessary antibiotic prescriptions.

Study Summary: This was a prospective cohort study based in 7 pediatric EDs in Canada. Eligible patients were 3 months–16 years of age who presented to 1 of the EDs from 2008-2011 with fever and cough and in whom the treating emergency doctor ordered a chest x-ray. Patients were excluded if there was a presumptive diagnosis of croup, bronchiolitis, or asthma. Children were also excluded if they had chronic illness or were recently treated with antibiotics. The authors used standardized collection of history, physical examination findings, laboratory and microbial testing results, chest x-ray reports and telephone

follow-up assessments after ED discharge for children clinically suspected to have pneumonia. Each case was subsequently reviewed by an independent panel of pediatrics specialists for a final consensus diagnosis as to whether the patient's presentation represented bacterial pneumonia, atypical bacterial pneumonia, viral pneumonia or not pneumonia. Complete blood count (CBC), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and blood culture were analyzed. Additionally, nasopharyngeal swabs were cultured for bacterial pathogens including pneumococcus, *Haemophilus* species, *Staphylococcus aureus*, group A streptococcus, *Moraxella catarrhalis* and *Bordetella*. Viral panels were performed for influenza, adenovirus, bocavirus, endemic coronaviruses, enterovirus, human metapneumovirus, parainfluenza virus, respiratory syncytial virus (RSV), and rhinovirus. Phone interview of parents was used for follow-up at 7 and 28 days.

Of the initial 1,294 children who met the study eligibility criteria, 373 eligible patients did not participate because of parental non-consent. A total of 269 children were enrolled and data from 247 patients were analyzed. The authors found that EPs diagnosed bacterial in 51% of cases, whereas the consensus determined 18% of cases were likely bacterial in etiology. Laboratory tests, specifically elevated white blood cell, erythrocyte sedimentation rate, CRP, and procalcitonin were significantly better at predicting bacterial pneumonia when compared to clinical assessment. Detection of viruses did not exclude bacterial pneumonia with one-third of those with bacterial pneumonia had viral coinfection. Patients >6 years of age and those with cough >5 days in duration were more likely to have bacterial pneumonia.

Editor's Comments: There are numerous reasons why this study's results should be interpreted with caution by UC clinicians. The investigators cleverly developed a complex study design, likely partly out of necessity due to the difficulty of certainty in diagnosis of pneumonia and its etiology in children in an acute care setting. The data remarkably encompasses children seen 10-15 years prior to the study's publication and many of children who presented with cough and fever were not enrolled. Those with chronic diseases, recent antibiotic use, language barriers, and a presumptive diagnosis of croup, bronchiolitis, or asthma were excluded and over 50% of eligible patients remaining were not enrolled due to parental consent. In other words, the vast majority of children with cough and fever who presented to these EDs during the study period were not included in the data set.

Additionally, this study's aim was to determine which clinical, radiologic, and laboratory criteria were most useful

to predict bacterial etiology, however, this is not a patient-oriented outcome. The more important question is which children with cough and fever will benefit from antibiotics. This study unfortunately does not address this. The authors do not report which patients were hospitalized, had a return ED visit, or any type of long-term outcome. This is especially problematic because their statistical methods, which are appropriate, suggest that blood laboratory findings are more predictive of bacterial etiologies of pneumonia than clinical findings. While this may be true, it is precarious messaging to suggest that measuring serum inflammatory markers and a CBC should be routine practice on children who are being discharged from the ED or UC with pneumonia as a consideration. The American Academy of Pediatrics specifically does not recommend lab testing in children being treated as outpatients for pneumonia. This study did confirm that clinical findings are poorly predictive of a bacterial etiology. Finally, the molecular (ie, PCR) respiratory pathogen panel is a problematic gold standard. Studies show that asymptomatic colonization rates with *M. pneumoniae* up to 5% and as high as 30% for *S. pneumoniae*. Therefore, it is likely that some patients with viral pneumonia were incorrectly categorized as having bacterial pneumonia based on false positive respiratory pathogen testing.

Due to these issues, this paper does not significantly add to our understanding about the diagnosis or treatment of pneumonia in children. Checking labs or respiratory pathogen swabs can be costly and traumatic for children and parents, and this study avoids addressing the question: Does all this testing improve outcomes or reduce antibiotic prescriptions in children with suspected pneumonia? ■

Do Older Patients Really Need a CT Scan after Minor Head Injury?

Take Home Point: In this study, older adult patients with suspected head trauma who are alert and hemodynamically stable had a low incidence of a clinically important traumatic brain injury (ciTBI).

Citation: Mellet T, West C, Emeto T, et al. Evaluation of Older Patients With Minor Blunt Head Trauma To Identify Those Who Do Not Have Clinically Important Traumatic Brain Injury And Can Be Safely Managed Without Cranial Computed Tomography. *Emerg Med Australas*. 2024 Dec 5. doi: 10.1111/1742-6723.14540

Relevance: Age >65 years is an exclusion for both the

NEXUS and Canadian Head CT rules. As most UC centers do not have access to immediate computed tomography (CT) scanners, UC clinicians often refer very low mechanism head injuries to emergency departments based solely on the patient's age. This can result in considerable expense and inconvenience for patients and their families for questionable benefit.

Study Summary: This was a single-site, prospective, observational cohort study based in a mixed, major referral emergency department (ED) in regional Queensland, Australia. The authors enrolled consecutive patients aged >65 years or older who presented with a suspected head injury by the treating clinician. All subjects included had a Glasgow Coma Scale (GCS) of 15 (or at baseline if underlying dementia) and were hemodynamically stable (defined as a combination of the absence of significant hemorrhage, poor organ perfusion, and hypotension by systolic blood pressure SBP). The primary outcome was the proportion of patients with ciTBI (defined as either a subdural hematoma, subarachnoid hemorrhage, epidural hematoma, or cerebral contusion which required medical or surgical intervention) within the 42 days of presentation. Follow-up was performed by electronic medical record review.

The investigators enrolled 276 patients meeting the inclusion criteria. The average age of subjects was approximately 80 years. 30% of patients had dementia and 52% were taking medications that increased the risk of bleeding. Roughly 25% of the patients lived in a care facility and the remainder lived independently. 80.8% of patients underwent head CT at the index ED visit and 3.3% had any intracranial hemorrhage. All patients who had an ICH arrived by ambulance and suffered injury from a fall. The incidence of ciTBI within 42 days of the initial ED visit was 2.5% (7 patients) and 71% of these patients were on an antiplatelet or anticoagulant agent. Six of 7 patients with ciTBI had external evidence of trauma above the clavicles (notable based on criteria in the New Orleans head CT rule). All patients with ciTBI either had external signs of head injury or new abnormalities on neurological examination. The most common mechanism of injury was a ground-level fall (93.8%) and all the ciTBIs in this study occurred in participants with ground-level falls. No patient with a ciTBI underwent neurosurgical intervention. Importantly, during the 42-day follow-up period, three patients died as a result of the TBI.

Editor's Comments: While this study does suggest that our clinical evaluation does, in fact, have utility in the risk stratification of older patients, including those with dementia and who are taking anticoagulants, this study was conducted

at a single site in Australia. While rare, ciTBI after minor head trauma still occurred in a small proportion of the older adults who appeared stable. This data is far from robust enough to change clinical policies from specialty societies regarding evaluation of head trauma in older adults. However, these findings do suggest the ongoing need to derive and validate a clinical decision rule specific to UC which could allow for more liberal criteria for clearance without CT. Until such a rule exists, it would be reasonable to cite this paper in instances of low clinical suspicion for ciTBI when a well-appearing, older patient is reluctant to go to the ED. The authors' findings provide some concrete figures which UC clinicians can reference for shared decision-making and informed refusal conversations. In such instances, it is critical to document and communicate clear indications for immediate ED evaluation with the patient and their family. ■

The Value of Cramming Prior to Performing Clinical Procedures – Is Just-In-Time Preparation the Ideal Strategy?

Take Home Point: In this study, a just-in-time training simulation intervention provided to inexperienced clinicians just prior to a high-stakes, rare procedure led to significantly higher rates of success when performing the actual procedure.

Citation: Flynn S, Park R, Jena A, et. al. Coaching Inexperienced Clinicians Before a High Stakes Medical Procedure: Randomized Clinical Trial. *BMJ*. 2024 Dec 16;387: e080924. doi: 10.1136/bmj-2024-080924.

Relevance: Depending on the practice setting, many acute care clinicians are faced with scenarios where an infrequently performed procedure is indicated. Preparation can be approached from a “just-in-time” (ie, reviewing procedure just before occasions when it will be performed) or “just-in-case” (ie, reviewing procedure regularly and being ‘always ready’). As procedures in UC rarely need to be performed immediately, there is typically an opportunity for a “just-in-time” approach to procedure review. This study examines “just-in-time” coaching and simulation for such a scenario.

Study Summary: This was a single center, prospective, non-crossover, parallel group, non-blinded, randomized clinical trial conducted at Boston Children’s Hospital, a

large quaternary academic medical center in the United States. Participants were anesthesiology trainees from 10 regional training programs doing pediatric anesthesia rotation at the study facility. The authors block randomized participants to treatment or control groups before they performed endotracheal intubation of children aged ≤12 months. The control group had unstructured intraoperative instruction in intubation by attending pediatric anesthesiologists. The treatment group received a standardized coaching session and simulation using an infant manikin within one hour of the actual procedure.

For the study, 172 trainees were randomized (89 control, 83 treatment) and 515 intubations were included (283 control, 232 treatment) and analyzed. The authors found first attempt success for tracheal endointubation was higher in the treatment group than in the control group (91.4% vs 81.6%, odds ratio 2.42 (95% confidence interval [CI] 1.45 to 4.04), $P=0.001$. The number needed to treat (NNT) for the primary outcome was 10.2 (95% CI 6.4 to 25.2).

A secondary outcome assessed was the effect on the perceived cognitive load during the procedure between the intervention and control groups. Just-in-time training was associated with a significantly lower perceived cognitive task load while performing the procedure. Specifically, the control group participants reported higher frustration, time demands, and mental demands. Furthermore, the rate of complications was higher in the control group, but did not reach statistical significance (4.71% vs. 2.75%, $P=0.22$).

Editor’s Comments: There are interesting findings from the study that may be useful to consider when training and upskilling UC clinicians. Specifically, it seems more valuable to ensure UC clinicians have access to immediately available educational and reference materials to review just before performing procedures. In some centers, even procedures like suturing lacerations may be performed infrequently. If this is true for the center where you practice or you have colleagues who feel uncomfortable with suturing, it would be worthwhile to have a practice suturing setup available on site so that clinicians who suture rarely might review the procedure and practice to build confidence before attempting the procedure on the patient. ■

Who’s a Better Diagnostician—AI or Doctors?

Take Home Point: In this study, the use of large language model (LLM) did not enhance the diagnostic reasoning of physicians beyond the normal conventional resources that are available. However, the LLM alone (ie, without a clini-

cian in-the-loop) scored higher than physicians with or without LLM assistance.

Citation: Goh E, Gallo R, Hom J, et. al. Large Language Model Influence on Diagnostic Reasoning: A Randomized Clinical Trial. *JAMA Netw Open*. 2024 Oct 1;7(10):e2440969. doi: 10.1001/jamanetworkopen.2024.40969.

Relevance: LLM models are rapidly gaining adoption as a form of artificial intelligence (AI) in many domains. The question of the role of LLM use in medicine, and more specifically diagnostics, is a hotly debated topic. This study investigated accuracy of diagnostic reasoning among physicians in a simulated setting with and without the aid of the LLM.

Study Summary: This was a randomized single-blinded study with participants randomized to use the LLM interface (intervention group) or conventional resources (control group). The LLM used was a version of ChatGPT-4. Participants reviewed cases that were based on actual patients. They were provided with relevant clinical information such as history, physical examination findings, and test results. Each participant reviewed at least 50 of the 105 available cases. The cases were scored for correctness of diagnosis and next steps for patient evaluation and treatment.

“It is indeed a dramatic finding that ChatGPT alone outperformed clinicians. It is important to note, however, that this study used clinical vignettes.”

Fifty physicians were enrolled. The participants were 26 attending physicians and 24 residents from a general medical specialty (ie, internal medicine, family medicine, or emergency medicine). In the study, 244 cases were completed by all participants (125 in LLM group, 119 in control group). The authors found that physician use of a the LLM chatbot did not improve diagnostic reasoning on challenging clinical cases. The diagnostic accuracy was 76% for the intervention group and 74% for the control group ($P=0.60$). The diagnostic accuracy of the LLM alone, however, significantly outperformed physician participants in both groups with a diagnostic accuracy rate of 92%

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($P=0.03$). The results were similar across subgroups of different training levels and experience with the chatbot.

Editor's Comments: This study has gained international attention among the lay press, and rightfully so. It is indeed a dramatic finding that ChatGPT alone outperformed clinicians. It is important to note, however, that this study used clinical vignettes. Although these were based on real patient presentations, it is unclear how such an LLM would perform without the structured input of relevant data. One of the most complex tasks for clinicians in diagnostic reasoning is understanding the requisite meaningful data to seek out and from what sources this data might be collected. This often comes mostly from patient interview, but it is not uncommon that additional data is required and collecting this data may require reviewing past medical records, conversations with other historians (eg, family members). Discerning what information is necessary, where to find it, and its reliability is a critical skill set for proficient diagnosticians. The vignettes in this study consisted of a neatly curated list of relevant data. All signal and no noise. This nuance is critically important, but unfortunately highly likely to be omitted when this study's results are discussed in the popular press or hospital board rooms. Without this context, it seems likely that those making decisions regarding clinician staffing and reimbursement will be inclined to undervalue the requisite detective work required to summarize a case—the necessary first step before an accurate diagnosis. ■

Heated Mittens for Hand Osteoarthritis

Take Home Point: The use of heated hand mittens did not positively affect hand function compared to standard, non-heated mittens in patients with osteoarthritis (OA).

Citation: Bartholdy C, Dossing A, Stisen Z, et. al. Effect of Heated Mittens On Physical Hand Function In People With Hand Osteoarthritis: Randomised Controlled Trial *BMJ*. 2024 Dec 17;387:e078222. doi: 10.1136/bmj-2023-078222.

Relevance: There has been a tradition of using heat therapy to provide symptomatic relief in the management of arthritis. This practice, however, has not been systematically investigated for effectiveness in any well-designed studies.

Study Summary: This was a randomized controlled trial investigating the effect of electronically heated mittens on improvement of hand function and pain in patients

with OA of the hands. Participants were recruited from an OA outpatient clinic in Copenhagen, Denmark. Participants were randomized in a 1:1 ratio to receive battery heated mittens with heat applied to the dorsal aspect of the hands (intervention group) or identical mittens in which the wiring was disconnected (control group). Participants were asked to wear the mittens for 15 minutes daily for 6 weeks. The primary outcome was a change in hand function from baseline after the 6-week intervention period. Secondary outcomes were change in hand pain and overall subjective sense of OA affecting their lives.

A total of 200 participants were randomized and 186 completed the trial (91 in the intervention group and 95 in the control group). The average age of patients was 71 years and 87% of participants were women. The authors found both groups had some improvement in their hand function scores, but there was no significant difference in the improvement between groups ($P=0.09$). There were small and not statistically significant benefits in the intervention group for pain and stiffness scales, but no difference in the other outcomes investigated (grip strength, tender joint count, and swollen joint count).

Editor's Comments: While this study suggests there is no benefit to heated mittens, there are some caveats to this conclusion. First, this was a relatively small, single center study with <100 participants in each arm. The patients were not blinded to the treatment that they received. The scores that were recorded did not specify if they were for 1 or both hand function and other aspects investigated, which may influence the outcomes. Additionally, the patients only wore the mittens for 15 minutes per day. It is unclear if wearing the mittens longer or more frequently might have influenced the treatment effect. OA of the hands is a frequent and debilitating condition with limited treatment options. Unlike OA of the hip, knee, or shoulder, OA in the hands cannot be cured surgically. Given OA's chronic nature and lack of effective treatment options, safe, non-pharmacologic interventions, including heat therapy, warrant further investigation. Certainly, this study is insufficient evidence to dismiss these therapies in patients, especially for those who report that heat therapy is helpful. ■



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

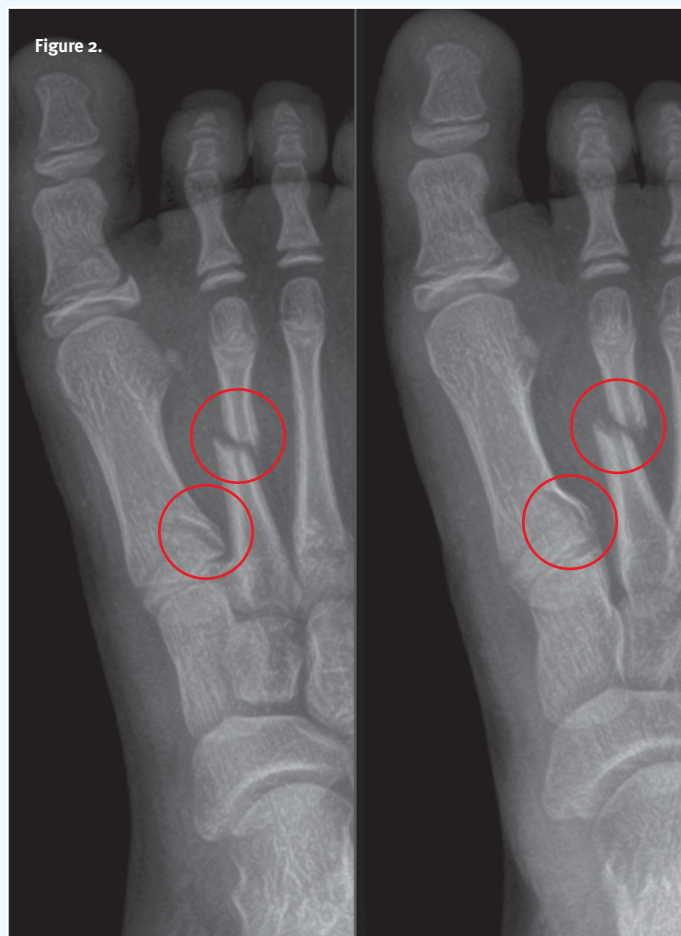
7-Year-Old With Playground Injury



A 7-year-old boy presents to urgent care with his worried mother after he fell off a swing at daycare. He is complaining of right foot pain and can't walk on the injured foot. Anterior, posterior and oblique foot x-rays are 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

- Fractures of the first and second metatarsals
- Midfoot sprain
- Second phalanx dislocation

Diagnosis

The correct diagnosis in this case is fractures of the first and second metatarsals. Oblique fracture at the mid-2nd metatarsal and an angled buckle fracture at the lateral base of the 1st metatarsal can be seen in the x-ray. The injury at the base of first metatarsal is concerning for a pediatric Lisfranc injury.

Metatarsal fractures are common foot injuries. Usually, there is a combination of direct axial loading forces and twisting forces. Typically, a buckle fracture results from axial loading forces being transmitted directly down the long axis of the bone. However, when there is any other force applied, such as a varus, valgus, hyperextension, or hyperflexion force, the axial load is shifted off center and angled buckle fractures of the metaphysis occur, although they are less common.

What to Look For

- The bones of children are soft, and therefore it is common for buckle rather than overt fracture to occur
- Look for complications from the fracture including neurovascular compromise and Lisfranc injury

Pearls for Urgent Care Management

- If nondisplaced or minimally displaced, treatment is immobilization with a posterior leg splint, non-weight bearing, and follow-up in 3-5 days
- Pain management with over-the-counter medications is usually sufficient once immobilization has occurred
- If significantly displaced, reduction is indicated
- If neurovascular complications exist, immediate referral to the emergency department is indicated



45-Year-Old With Painful Ankle Lesion



A 45-year-old woman presents to urgent care with a painful area that developed on her right ankle 2 weeks prior. The patient had a family history of venous thromboembolism. On examination, a variegated brown patch with a central pink angulated scar and an overlying thick crust on the lateral ankle was seen. There was also unilateral peripheral leg edema. On laboratory examination, anemia, thrombocytopenia and anticardiolipin antibodies were present.

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).

Figure 2.



Differential Diagnosis

- Antiphospholipid antibody syndrome
- Cryoglobulinemia
- Livedoid vasculopathy
- Polyarteritis nodosa

Diagnosis

The correct diagnosis in this case is antiphospholipid antibody syndrome (APS)—an acquired autoimmune disease characterized by the formation of autoantibodies against various phospholipids. These antibodies cause an increased propensity for clotting by interfering with the function of proteins C and S, as well as directly interacting with platelets and the endothelium. APS is commonly attributed to an underlying autoimmune disease, such as systemic lupus erythematosus or less commonly HIV or hepatitis C. Additionally, several medications are associated with APS, including chlorpromazine, hydralazine, and procainamide.

Symptoms vary depending on the organ system involved. The most common thrombotic events occur in the deep venous system, usually in the leg. Respiratory compromise may signal a pulmonary embolism. Obstetric complications include premature delivery, unexplained fetal loss beyond 10 weeks of gestation, or 3 or more episodes of unexplained consecutive spontaneous abortions before

10 weeks of gestation. Neurologic deficits include severe migraine headaches, visual disturbances, and stroke. In rare cases, catastrophic antiphospholipid antibody syndrome can develop, characterized by rapid development of widespread thrombotic disease involving at least 3 organ systems, which can include the skin.

What to Look For

- APS may present with painful cutaneous ulcers and necrosis
- Look for evidence of thrombosis in the organ system affected (for example, leg swelling indicating a deep vein thrombosis or shortness of breath indicating a pulmonary embolism)

Pearls for Urgent Care Management

- In this case, appropriate wound care for the cutaneous ulcer depending on location and depth is needed
- Pain management considering topical anesthetic agents is indicated
- Refer to rheumatology for further evaluation and treatment
- Referral to the emergency department is advisable if evidence of severe disease is observed (eg, deep vein thrombosis, pulmonary embolism, stroke)

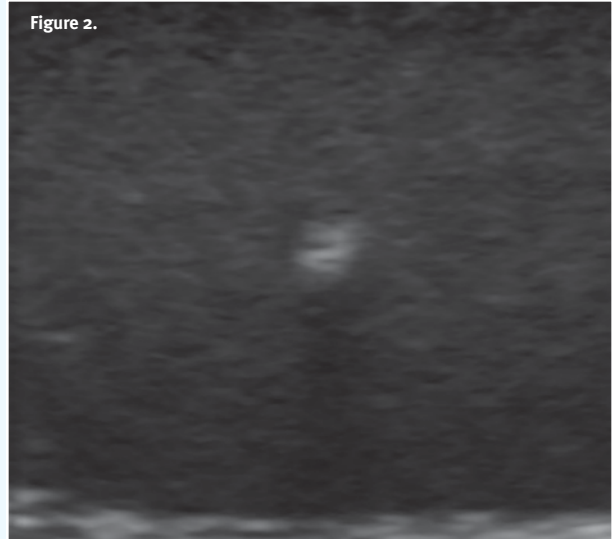


57-Year-Old with Left Foot Pain

Figure 1.



Figure 2.



A 57-year-old man presents to the urgent care with a 3-day history of left foot pain and swelling after walking barefoot on a wooden deck under construction. He recalls feeling a sharp pain in the affected foot at the time but could not see any foreign object. On examination, he has mild erythema, tenderness, and induration over the plantar surface of the midfoot. There is no visible puncture wound or foreign body present. Plain radiographs (XR) of the foot reveal no radio-opaque foreign body or bony abnormalities. A point-of-care ultrasound (POCUS) of the foot is performed in 2 planes.

View the POCUS image 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, an emergency physician based in New York, New York, and the founder of Hello Sono.

Differential Diagnosis

- Puncture wound
- Retained organic material foreign body
- Contusion
- Abscess
- Cellulitis
- Osteomyelitis
- Plantar fasciitis

Diagnosis

The correct diagnosis in this case is a retained wooden splinter in the plantar soft tissues. While the physical exam and XR are non-diagnostic, the POCUS exam reveals a hyperechoic (white) structure in the plantar soft tissues with posterior shadowing (black), consistent with a wooden foreign body; this was confirmed after removal in urgent care. The shape of the object is linear, as evidenced by the punctate appearance in one plane and linear appearance in the other. A slight surrounding hypoechoic (light gray) halo was also observed, indicative of inflammatory changes. No fluid collection was identified, indicating that no abscess was present.

Discussion

Retained wooden splinters are commonly missed on initial evaluation due to their radiolucency and nonspecific associated symptoms. XR has limited sensitivity for detecting radiolucent foreign bodies (eg, wood and plastic) with sensitivities reported as low as 5-20%.^{1,3} Ultrasound offers a significant advantage in identifying radiolucent materials, with sensitivities ranging from 78-100% for wood.^{1,4} On ultrasound, wooden foreign bodies appear as hyperechoic structures with posterior acoustic shadowing. A hypoechoic halo is seen when the foreign body has been retained for over 24 hours, indicating inflammation.⁵ Visualization in multiple planes can help determine the shape of the object. The water bath technique can improve visualization of small foreign bodies in small or superficial structures, such as digits and hands.⁶

Additional advantages of POCUS for evaluating soft tissues for retained foreign bodies include its ability to assess for associated abscess formation, and the function of Color Mode to identify superficial vasculature structures. Furthermore, POCUS can provide real-time guidance during the foreign body extraction process, which can enhance precision and reduce the risk of discomfort and complications.

Despite its utility, POCUS does have limitations: Sensitivity will be reduced in the hands of inexperienced operators; acoustic artifacts such as gas shadows from infections or overlying tissues can obscure visualization; and differentiation between foreign bodies and other hyper-

echoic structures, like calcifications, may be challenging. Despite these limitations, when used in conjunction with clinical context and proper technique, ultrasound can be a valuable tool for assisting in identification and removal of soft tissue foreign bodies.

What to Look For

- Retained foreign bodies often present with localized pain, swelling, and erythema. A visible puncture wound may not always be present.
- On ultrasound, wooden foreign bodies appear as hyperechoic structures with posterior acoustic shadowing.
- Look for an associated anechoic (black) fluid collection which may represent an abscess.
- Measure the size and depth of the foreign body to guide removal.

Pearls for Urgent Care Management

- Employ POCUS to detect radiolucent foreign bodies. Familiarity with sonographic characteristics of various foreign body materials can enhance diagnostic accuracy.
- Promptly remove foreign bodies once identified (under ultrasound guidance when feasible) to prevent complications such as deep space infection/osteomyelitis, granuloma formation, and chronic pain.
- Ensure tetanus vaccination status is up-to-date and consider antibiotics when signs of infection are present.
- Urgent referral to a podiatrist is indicated for cases with deep (eg, embedded near tendons, joints, or neurovascular structures) or complex foreign bodies (eg, irregularly shaped or multiple fragments), failed removal attempts, or in high-risk patients and those with severe pain/functional impairment.

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68-Year-Old With Dyspnea

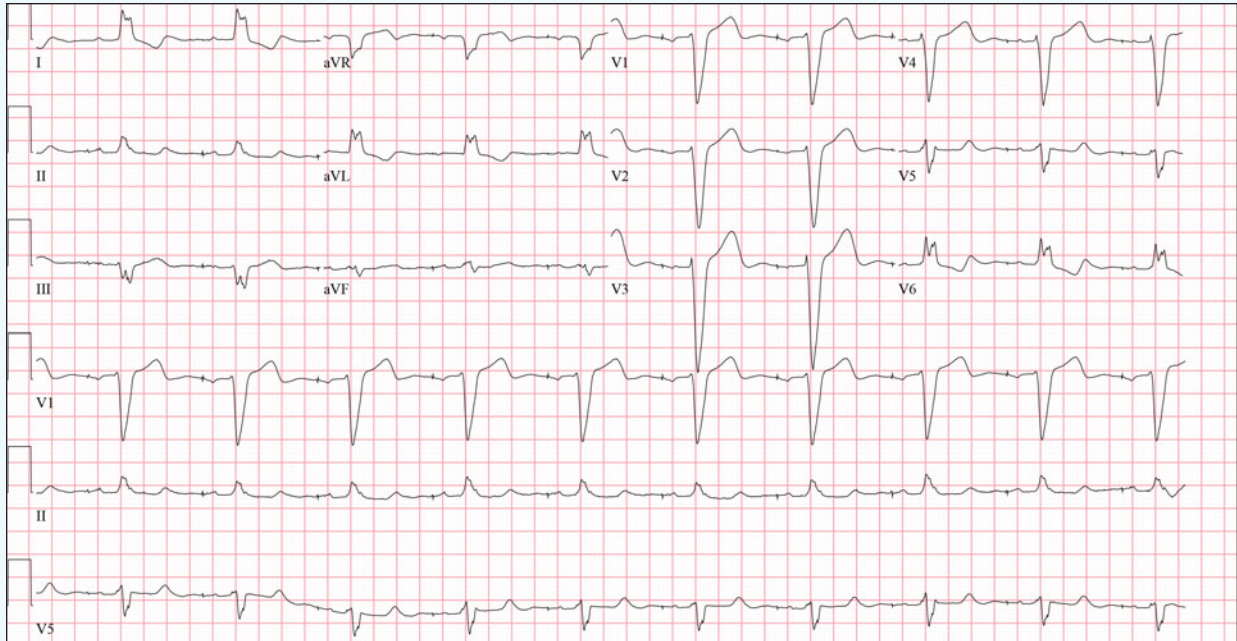


Figure 1: Initial ECG

A 68-year-old female presents to urgent care with dyspnea for 2 days. She has a medical history of heart failure. 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, McGovern Medical School, The University of Texas Health Science Center at Houston, Department of Emergency Medicine.

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

ECG STAMPEDE

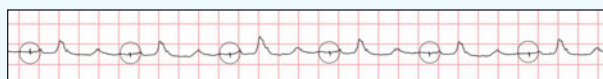


Figure 2: Pacer spikes seen preceding the atrial complexes in the lead II rhythm strip (circles)

I	II	III
Chamber paced	Chamber sensed	Response to sensing
O = none A = atrium V = ventricle D = dual (atrium and ventricle)	O = none A = atrium V = ventricle D = dual (atrium and ventricle)	O = none T = triggered I = inhibited D = dual (trigger and inhibition)

Figure 3: Pacemaker code

Differential Diagnosis

- Atrial fibrillation
- Ventricular paced rhythm
- Atrial paced rhythm
- Sinus bradycardia

Diagnosis

The diagnosis in this case is atrial paced rhythm, left bundle branch block. This ECG shows an atrial paced rhythm with a rate of 60 beats per minute. There is a left bundle branch block without signs of ischemia. For more information regarding left bundle branch blocks, see the ECG

case in the May 2023 issue of *JUCM*.¹

Pacer spikes are visualized preceding the atrial complexes (**Figure 2**), indicating that the pacemaker initiated the impulse. Implantable pacemakers are indicated for a range of electrophysiologic issues including (but not limited to) sinus node dysfunction, high-grade atrioventricular block, syncope and bundle branch block, and cardiac resynchronization therapy for severe systolic heart failure.^{2,3} They are programmed with 5 variables, 3 of which are relevant for urgent care providers. The 3 variable code indicates: 1) the chamber paced; 2) the chamber sensed; and 3) the response to sensing (**Figure 3**).⁴

The presence of atrial pacer spikes indicates that an atrial lead is present. A ventricular lead is likely present (ie, dual chamber pacemaker), although ventricular spikes are not seen. The most common pacemaker mode is DDD, which indicates that both chambers (ie, right ventricle and right atrium) have the potential to be paced and sensed, and the response to sensing can be either inhibitory or triggering. When the intrinsic rate drops below a certain threshold (eg, 60 beats per minute), the pacemaker triggers a signal. In this case, an atrial signal is triggered, and the ventricular contraction is allowed to occur naturally provided that the atrioventricular delay does not exceed a predefined threshold. If the atrioventricular delay were to exceed the predefined threshold, the ventricular lead would also trigger a signal resulting in a pacer spike preceding the ventricular (ie, QRS) complex. Atrial pacing

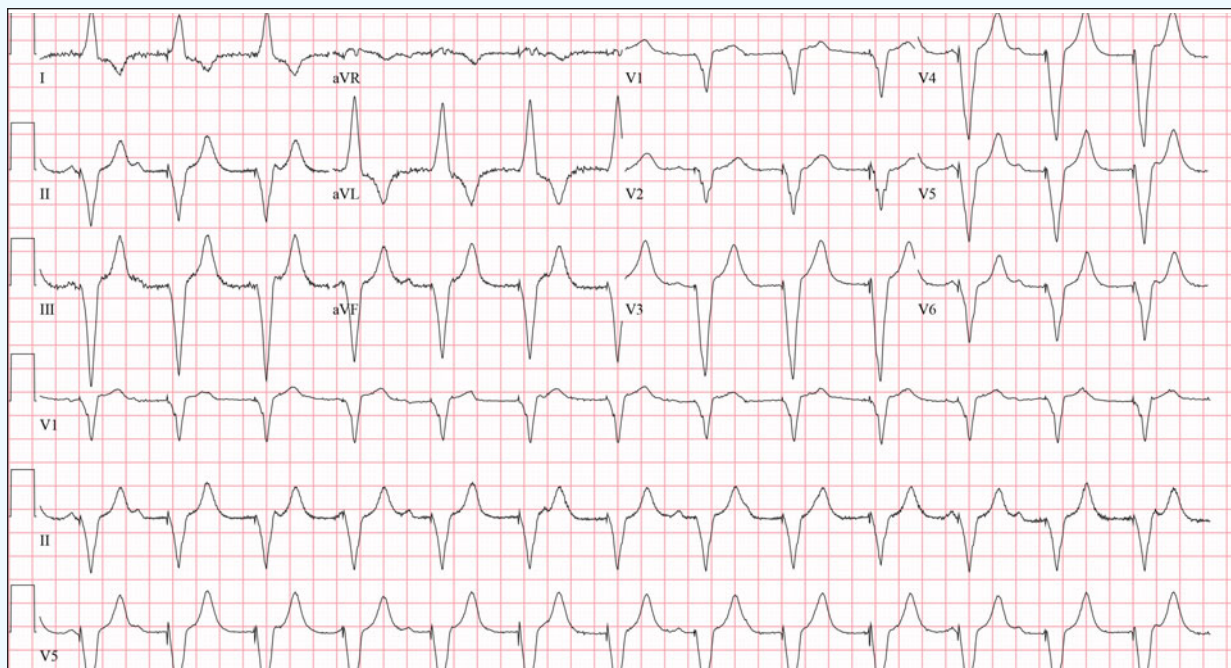


Figure 4: Pacer spikes preceding the ventricular complexes in VVI mode.

does not interfere with recognition of ischemic patterns.

Another common pacemaker mode is VVI. In this mode, the ventricle is sensed and paced via a single right ventricular lead, and the response to sensing is inhibition. If intrinsic activity is sensed and the rate is above the threshold, then the pacemaker will inhibit the response; otherwise, the pacer will initiate a signal resulting in a pacer spike preceding the ventricular (ie, QRS) complex (**Figure 4**).

The presence of an implantable pacemaker itself is not an indication for emergency department (ED) referral; however, it is an indicator of electrophysiologic pathology, and the urgent care provider should maintain a low threshold to refer someone to the ED with cardiopulmonary complaints and a known pacemaker to a cardiac capable ED.

What to Look For

- Pacer spikes preceding the atrial (eg, P waves) or ventricular (eg, QRS complexes) indicate the presence of a pacemaker.
- Pacemaker modes are indicated by a 3-code system which refers to: 1) the chamber paced; 2) the chamber sensed; and 3) the response to sensing.
- Atrial pacing does not interfere with recognition of ischemic patterns.

Pearls for Management, Considerations for Transfer

- Maintain a low threshold to refer patients with pacemakers that present with cardiopulmonary complaints (eg, chest pain, dyspnea, syncope) to a cardiac capable ED.

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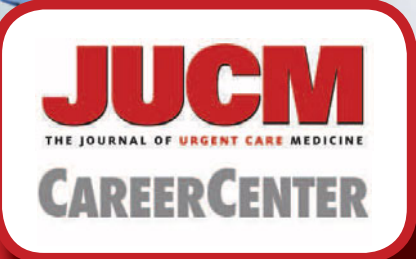
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