

JUCM[®]

THE JOURNAL OF URGENT CARE MEDICINE[®]

NOVEMBER 2024
VOLUME 19, NUMBER 2

UCA URGENT CARE ASSOCIATION

COLLEGE OF URGENT CARE MEDICINE

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The Official Publication of the UCA, CUCM, and UCCP

ORTHO CASE SERIES **cme**

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Are We Ready for a Day Without Urgent Care?

■ Rajesh Geria, MD; Patrick O'Malley, MD

Every year, our nation's 14,000 urgent care (UC) clinics care for nearly 206 million patients, equating to 564,383 patients every day across the country.¹ Imagine what would happen if there was no urgent care for just a single day. Now imagine that if that possibility lasted not just a day, but indefinitely. Unfortunately, many communities are at risk for this reality coming to pass. Decreasing reimbursement, clinician burnout, and administrative burdens make keeping the doors of UC centers open increasingly challenging.

Our healthcare system narrowly avoided collapse during the COVID-19 pandemic, largely thanks to the existence of UC. The Urgent Care Association (UCA) and the College of Urgent Care Medicine (CUCM) quickly mobilized to work with key government agencies and stakeholders, such as the American College of Emergency Physicians, to develop testing protocols, surge management strategies, and vaccination rollout plans.

While many physician offices closed or refused to care for patients with possible COVID-19 infection, they instead offered a blanket, default guidance to patients: "Go to urgent care." During this time, it was not uncommon for up to 150 patients to visit a single UC center within a 12-hour shift. Although most of that volume was related to COVID test requests, UC was able to care for those patients successfully, keeping them out of the emergency department (ED)—the only other option they might have had left for unscheduled, acute care needs. Simply put, urgent care saved the day. Let's explore what the U.S. healthcare landscape might look like in a counterfactual world without UC.



Rajesh Geria, MD, is an urgent care and emergency physician affiliated with CityMD and Envision Health in East Brunswick, New Jersey. **Patrick O'Malley, MD** is an urgent care and emergency physician affiliated with Newberry County Memorial Hospital in Newberry, South Carolina.

Ripple Effects

If UC centers were to close, even for a day, the ripple effects would be felt across the entire healthcare system. UC centers fill the very real gap between primary care providers (PCPs) and emergency departments. It is common for patients to call PCP offices only to be told there are no available appointments for weeks or months. The common refrain is, "Just go to urgent care. Go to the ED if you are sick." Experts have written about what would happen if there was a day without the ED.²

If UC clinics were to close for a day, the immediate effects would be felt across the healthcare system, starting with the patients who rely on these facilities for quick, accessible medical attention. Minor, unexpected nuisances are a part of every aspect of life, and human health is no exception. When these situations arise unpredictably (as they always do, by definition), patients are left to determine how they should handle the non-life-threatening injuries and new symptoms through self-triage.

Before the advent of UC clinics, patients would usually call their PCP and request an urgent visit. However, this was predicated on PCPs having capacity for urgent visits. This is rarely the case in current times. Current statistics on the number of Americans who have a primary provider are clear that fewer and fewer patients have a PCP.^{3,4} Meanwhile, wait times for appointments that are measured in months are commonly encountered, which is not ideal if you have an abscess that needs draining or sudden onset of vomiting and diarrhea. Increasingly, patients are also using UC for complaints like low-risk chest pain, abdominal pain, dizziness, weakness, head injury, cellulitis, shortness of breath, and headache. Most of these UC patients are also able to avoid the stress and expense of an ED visit through clinical evaluation, basic point-of-care testing, coordination and guidance for follow-up, and shared decision-making surrounding the nearly ubiquitous, lingering diagnostic uncertainty.

If UC centers were all to close, patients who called their PCP offices for guidance would more often be directed toward an ED designed to handle severe and life-threatening conditions. ED waiting rooms would become even more overcrowded, and the already problematic wait times would balloon. Most critically, the additional load of over a half million visits for patients who might have otherwise been seen in UC would almost certainly divert resources from more critical patients. This strain would not only affect patients, but undoubtedly add to the already considerable stress and workload placed on emergency medical staff. The inefficiency of seeing patients with low-resource needs in a high-resource setting would significantly increase healthcare costs. More than 2 out of 5 Americans currently have healthcare-related debt—more than any other nation in the world.⁵ The proportion of individuals in this unenviable position, however, could be much higher if acute care were delivered exclusively in ED settings.

“The closure of UC clinics, even temporarily, would highlight their role in the healthcare ecosystem as vital pressure valves.”

Over recent years, the availability and use of telehealth platforms has dramatically increased. Fueled by the COVID-19 lockdown, both clinicians and patients alike were forced to adapt to this new mode of accessing care nearly overnight. It is certain that telehealth offers benefits in reducing cost and improving convenience of accessing healthcare. After 2021, however, U.S. telehealth utilization has trended down overall, suggesting that when it comes to healthcare access, many Americans still are prioritizing face-to-face interactions with their clinicians over convenience.⁶

Another near certain phenomenon that would occur if UC centers were to all close would be many patients choosing the “none of the above” option. Not seeking care due to fears of financial implications is tremendously common in U.S. One quarter of U.S. adults surveyed in 2022 admitted to not seeking medical care that they thought they needed because of cost concerns.⁷ It’s quite probable that this number would be much higher if the ED was the only option for acute,

unscheduled care needs. Additionally, this would increase healthcare disparities as individuals with annual household incomes below \$40,000 were more than three times less likely to avoid seeking care than those with household incomes greater than \$90,000.⁷

The closure of UC clinics, even temporarily, would highlight their role in the healthcare ecosystem as vital pressure valves. These clinics not only provide a cost-effective solution for minor medical issues but also help to segment the patient population based on the severity of their conditions, thereby optimizing the overall flow and management of healthcare resources. Urgent care centers also increase healthcare accessibility with over 14,000 locations nationwide throughout the U.S., offering extended hours of operation on nights and weekends.¹ For this reason, the public health functions of UC cannot be underestimated.

The Promise of UC

Experts estimate the average margins in 2024 for UC centers in the United States to be in the low single digit percentages, perhaps as low as 1% or less. Unlike critical access hospitals and federally qualified health centers, which receive governmental support to help keep their doors open for the purposes of maintaining healthcare accessibility, such federal financial assistance for UC is very rare.⁸ If these grim financial circumstances continue unabated, we face a threat that a reality without urgent care may be more than just hypothetical.

We salute the tens of thousands of UC clinicians who showed up when they were needed most throughout the pandemic and who continue to show up every day for every patient who walks through their doors. The legitimate concerns about managing costs from UC owners and operators foster a continuous situation where both human and physical resources can be frustratingly limited. This situation will not abate unless significant changes are made. Equitable reimbursement for care—as opposed to the increasingly common payer practice of using case rates—is central to this change. Additionally, federal and local governmental support commensurate to the vital role UC plays in preventing collapse of our healthcare infrastructure is needed. With increased funding, other important changes, such as improved worker protections, compensation, and patient access, will allow UC to more assuredly deliver on the promise of delivering high-quality care to our patients.

The situation is unfortunately not likely to improve if we do not advocate for the value we bring to the table and the needs we have if UC is to survive. We implore

you to get involved in some way. If you're not a UCA member, please join. Join your regional UCA organization as well (such as the Northeast Regional Urgent Care Association). Get involved in local UC advocacy efforts and meet with or write to your state and federal representatives in congress. Join the CUCM. Attend regional and national UC conferences. Register and attend the many free educational webinars that each of these organizations have every year. Share them with your colleagues. Read *JUCM* and submit articles. Grow the specialty. Not everyone has to do all of these, but if we each contributed something in the area where we felt most passionate, we might very well spare the public who rely on us from ever having to experience the terrifying possibility of even a day without urgent care. ■

“The situation is unfortunately not likely to improve if we do not advocate for the value we bring to the table.”

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2024

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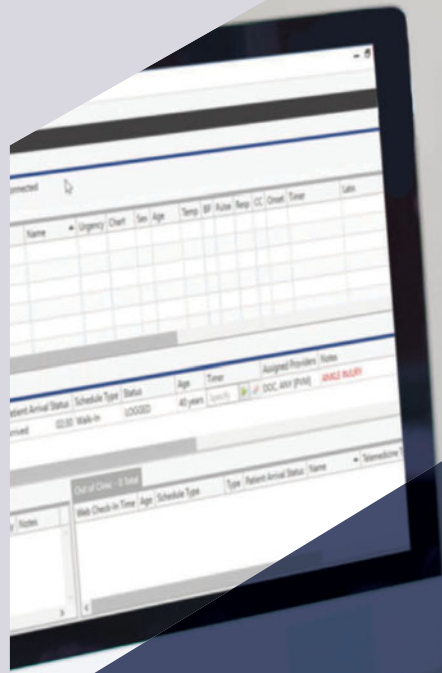
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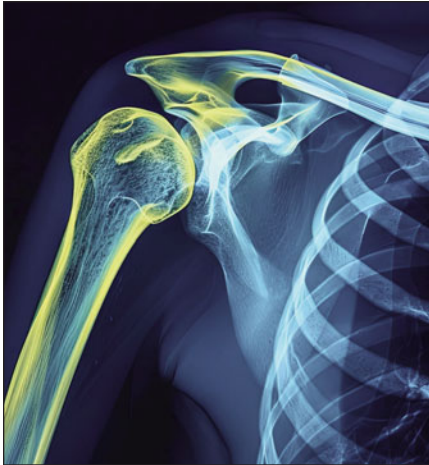
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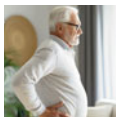
13 Urgent Care Recognition and Management of Proximal Humerus Fractures

Proximal humerus fractures most commonly occur in older patients after a fall onto the shoulder, however, acute medical issues that affect balance should also be part of the evaluation. Both displaced and nondisplaced proximal humerus fractures are typically managed with a simple shoulder sling, passive range of motion, and physical therapy.

Lauren Schuermann, MS4; Shivani Kothari, MS4; W. Bradley Strauch, MD

CASE REPORT

21 Urinary Retention Caused by a Urethral Stone Diagnosed With Point-of-Care Ultrasound: A Case Report



Urethral obstruction can occur due to impacted urinary calculi. This etiology should be considered in patients with history of kidney stones who present with urinary retention. Point-of-care ultrasound can be used to confirm this diagnosis.

Nicholas Maenza, DO; Jeffrey Darko, MD

CASE REPORT

25 Puffy Hand Syndrome: A Case Report

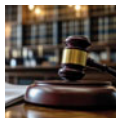


Incorporating questions regarding the use of intravenous drugs may help ensure the diagnosis of puffy hand syndrome is included in the differential for patients presenting with bilateral hand swelling.

Ifrah Majeed, DO; Kenneth VanDyke, DO

PRACTICE MANAGEMENT

29 How Should an Urgent Care Handle Requests for Medical Records by Subpoena?

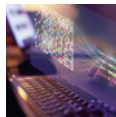


Urgent care centers need documented, consistent, and reportable processes for receiving, tracking, and responding to subpoenas for patient medical records.

Alan A. Ayers, MBA, MAcc

ORIGINAL RESEARCH

35 Development of a Positive Urinalysis Criteria Using a Machine Learning Approach



This secondary analysis of data from a quality improvement project in a network of pediatric urgent care centers used a machine learning approach to determine which variables on urinalysis most strongly predict a subsequently positive urine culture.

Kari Flicker, BS; Jessica Parrott, DNP, CPNP-PC, CNE; Tammy Speerhas, DNP, FNP-C; Turaj Vazifedan, DHSc; Theresa Guins, MD; Jeffrey Bobrowitz, MD; Anne McEvoy, MD; Jade Eves, PA-C; Debra Conrad, MD; Benjamin Klick, MD

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URGENT INTERACTIONS



“It is easier to defend that a test is not indicated than it is to explain an abnormal result.”

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



“Reassurance is a big part of healing.”

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



“The College of Urgent Care Medicine and Urgent Care College of Physicians are working collaboratively to move quickly and efficiently toward the recognition of the specialty of Urgent Care medicine. These two entities allow us to grow our work and voice, and I am excited to lead both organizations and their strong teams during this pivotal time in our history.”

— **Cesar Mora Jaramillo, MD, FAAFP, FCUCM**
President of the College of Urgent Care Medicine and Urgent Care College of Physicians



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- Uses of artificial intelligence in urgent care (such as, scribes, radiology, patient follow-ups)
- Skin conditions related to tattoos and body piercings
- Unusual causes of sore throat and ear pain
- What to do when patients have a fever and negative viral testing
- Less common hand and foot fractures



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Reflections

■ Lou Ellen Horwitz, MA

Clarity is a good thing, but achieving clarity isn't always easy. It requires a deep understanding, and reaching that depth takes time and energy. It's taken us a few years.

In 2022, we got clarity around the role of the Urgent Care Association (UCA). For a long time, we tried hard to do anything that anyone in Urgent Care needed, and that led to a lot of good work but also a very unclear identity. Now we know: We are here to ensure the advancement and long-term success of Urgent Care. That framework has helped us figure out what we should be doing and will continue to guide our product and program development for a long time.

For the last two years we've worked through the exercise of articulating our values. First, we had too many, then they were too vanilla, then they got too wordy, then...we really had it. I tip my hat to our Board of Directors and to staff members Samantha Wulff and Brandon Davis for all of the brainstorming meetings and critiques and honest talk about who we are at UCA and what we stand for.

I've titled this column "Reflections" not because I am looking back but because what we encountered through our values discovery process was how much UCA reflects Urgent Care itself. Many times, we had to ask, "Are we talking about Urgent Care or are we talking about UCA?" I came to realize that not only is it a good thing that we are reflections of each other, it's the only way it could have turned out right.

The Values of UCA

First, **We Commit**. Here at UCA and out in the field, what we do requires commitment. There are so many frustrations and barriers that we have to push through to get where we need to go, and if we aren't embracing those

challenges, we are not going to get there. Patients need Urgent Care, clinicians and operators need support, and healthcare delivery needs improvement. At UCA and in Urgent Care, we own our role in the future of healthcare.

Second, **We Collaborate**. The entities of the Urgent Care "universe" (UCA, the College of Urgent Care Medicine, the Urgent Care Foundation, and the Urgent Care College of Physicians) must not only support each other from a distance but fully integrate our goals and pursuits so our whole is larger than the sum of our parts. Our industry vendors are key collaborators in creating products and services that are perfect for Urgent Care and also in supporting the work of UCA and our Affiliates. Collaborating with our Affiliates—the *Journal of Urgent Care Medicine*, Hippo Education, Site Data Services, and Control the Dose—allows us to advance Urgent Care in ways UCA could never do alone. We work closely with each of our chapters, and we create collaborations outside of our "universe" to connect Urgent Care to a larger whole. Collaboration pushes us all. We believe the best innovations come from diversity of thought, experience, perspective, and approach, and we own our role in fostering collective ingenuity.

Lastly, **We Advance**. We have a drive to make things that we touch better than they were when we found them, including ourselves, our colleagues, our members, and our work together. For us, good enough is never good enough. It's how we are made, and we couldn't turn it off if we wanted to. We own our role in driving change.

Once we were done with unearthing these for ourselves—**We Commit, We Collaborate, We Advance**—we were struck with how these 3 statements are emblematic of Urgent Care itself. You have to love it. You have to commit because it's hard. And there's no better example of collaboration than the symphony of front and back office teams guiding people through an exceptional patient experience. And you can't hold Urgent Care back. It's going to advance, no matter what. I hope that when you see what we stand for, when you see UCA, you see yourself too. ■



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



CONTINUING MEDICAL EDUCATION

Release Date: November 1, 2024
Expiration Date: October 31, 2025

Target Audience

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

Learning Objectives

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

Accreditation Statement



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

Medical and Nursing Education (IMNE) and the Institute of Urgent Care Medicine. IMNE is accredited by the ACCME to provide continuing medical education for physicians. The IMNE designates this journal-based CME activity for a maximum of 3 *AMA PRA Category 1 Credits*[™].

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Urgent Care Recognition and Management of Proximal Humerus Fractures (page 13)

1. What is the typical mechanism for a proximal humerus fracture?

- a. Low-energy trauma that may be classified as fragility fracture
- b. Direct blow to the sternum
- c. Direct blow to the scapula
- d. Overuse injury

2. What are the main classification systems used to describe proximal humeral fractures?

- a. Neer and AO
- b. Salter and Harris
- c. Lisfranc and Jones
- d. All of the above

3. When should proximal humerus fractures presenting in urgent care be referred to an emergency department?

- a. For arm movement that causes pain
- b. For open fractures
- c. For fractures with neurovascular involvement
- d. Both B and C

Urinary Retention Caused by a Urethral Stone Diagnosed with Point-of-Care Ultrasound: A Case Report (page 21)

1. If a urinary calculus becomes lodged in the penile urethra, what can be used to aid in diagnosis?

- a. X-ray
- b. Retrograde urethrography
- c. Point of care ultrasound
- d. All of the above

2. At what rate will urinary calculi sized 1-4mm pass through the urethra?

- a. 2%
- b. 16%
- c. 62%
- d. 78%

3. In cases of urinary calculi where urinary retention cannot be resolved in urgent care, what is the recommended course of action?

- a. Referral to emergency department
- b. Referral to urology
- c. Referral to primary care
- d. Referral to oncology

Puffy Hand Syndrome: A Case Report (page 25)

1. What key indicator should prompt inquiry about intravenous drug use for patients presenting with swelling in the bilateral hands?

- a. Stigmata on the extremities
- b. History of hepatitis C
- c. Difficulty of venous access
- d. Any of the above

2. Which test confirms a diagnosis of puffy hand syndrome?

- a. X-ray
- b. Computed tomography
- c. White blood cell count
- d. None

3. Treatment of puffy hand syndrome involves which of these?

- a. Low stretch bandages and elastic compression gloves
- b. Immobilizing brace and arm sling
- c. Paraffin application and ultraviolet light exposure
- d. No treatment is indicated

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Urgent Care Recognition and Management of Proximal Humerus Fractures

Urgent Message: Proximal humerus fractures most commonly occur in older patients after a fall and can be sentinel events that offer an opportunity to identify undiagnosed medical conditions or unsafe home environments.

Lauren Schuermann, MS4; Shivani Kothari, MS4; W. Bradley Strauch, MD

Citation: Schuermann L, Kothari S, Strauch B. Urgent Care Recognition and Management of Proximal Humerus Fractures. *J Urgent Care Med.* 2024; 19(2): 13-19

Clinical Scenario

A 72-year-old, right-hand dominant man presented to urgent care (UC) with right shoulder and arm pain after a mechanical fall from standing earlier that day. He noted that he tripped on a rug and fell directly onto his right shoulder at home, striking the edge of a stair before he could brace himself. His pain is worsened with any attempts to move the shoulder. He denied neck pain, elbow and wrist pain as well as numbness or paresthesia anywhere in the arm. He denied hitting his head. He had no history of prior falls. His past medical history was significant for hypertension, depression, and hyperlipidemia. He was a daily cigarette smoker and drank alcohol frequently but was not intoxicated at the time of the fall or at the time of his UC presentation.

His vital signs were significant for an elevated blood pressure with mild tachycardia and tachypnea. He was alert, oriented, and appeared uncomfortable with his right arm held in abduction against his side. Any attempts at movement of the right shoulder passively caused obvious increases in his pain. He had a superficial abrasion on the lateral aspect of the right shoulder and generalized tenderness with palpation of the entire right shoulder, most significant laterally. He denied tenderness with palpation of the arm from the wrist to distal hume-

Questions for the Clinician at the Bedside

1. What are the common mechanisms for proximal humerus fractures?
2. What complications may be encountered in patients with proximal humerus fractures?
3. When is emergency department referral or surgery indicated?
4. How should patients discharged from urgent care be managed?

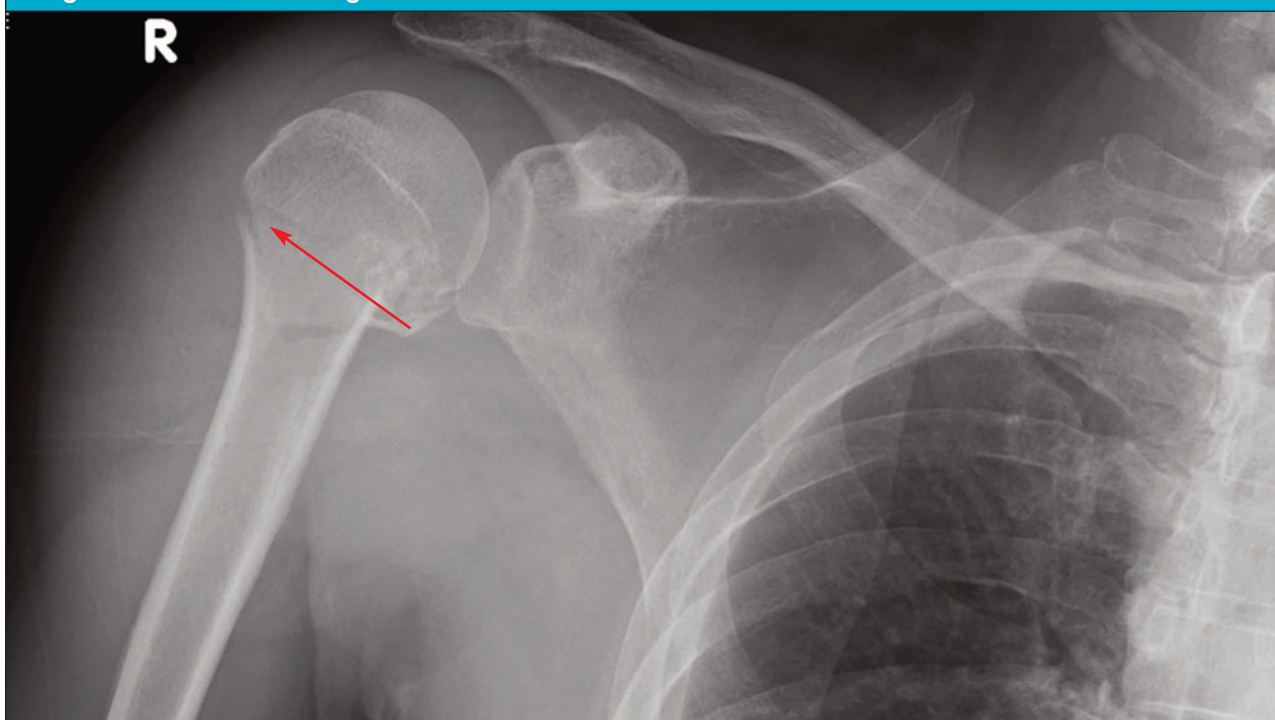
rus, the entire clavicle, sternum, scapula, and cervical spine. There was no obvious deformity or empty sulcus sign. His sensation throughout the right hand, forearm, and lateral upper arm was intact, and he had normal movements of right hand and wrist. He could supinate and pronate his forearm without significant discomfort but refused to move his right shoulder actively due to pain. He had strong radial and ulnar pulses. Screening exam of the rest of his extremities, head, and torso revealed no concerning findings or evidence of trauma.

X-rays (XR) of the right shoulder were obtained which demonstrated a comminuted and minimally displaced fracture of the proximal humerus (**Image 1**).

Relevant Anatomy

The humeral head articulates with the glenoid fossa of

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Image 1. Anterior-Posterior Right Shoulder With Proximal Humerus Fracture

the scapula, forming the glenohumeral (shoulder) joint space. Other osseous structures in this region include the distal clavicle and acromion and coracoid processes of the scapula. The proximal humeral anatomy is divided into the anatomic neck (formed when the physis fuses in adolescence) and the surgical neck, a structurally weaker area located inferior to the humeral head. Due to this inherent weakness, proximal humerus fractures are most common at the surgical neck.¹

The shoulder joint, relative to other ball-and-socket joints (eg, the hip), sacrifices stability for greater mobility and range of motion. Unlike the acetabulum, the humeral head is held in place predominantly by tendinous insertions of the rotator cuff musculature (**Image 2**).² The rotator cuff is comprised of 4 muscles and their myotendinous attachments. Teres minor, supraspinatus, and infraspinatus all attach to the greater tuberosity of the humerus; the subscapularis alone inserts on humerus' lesser tuberosity.²

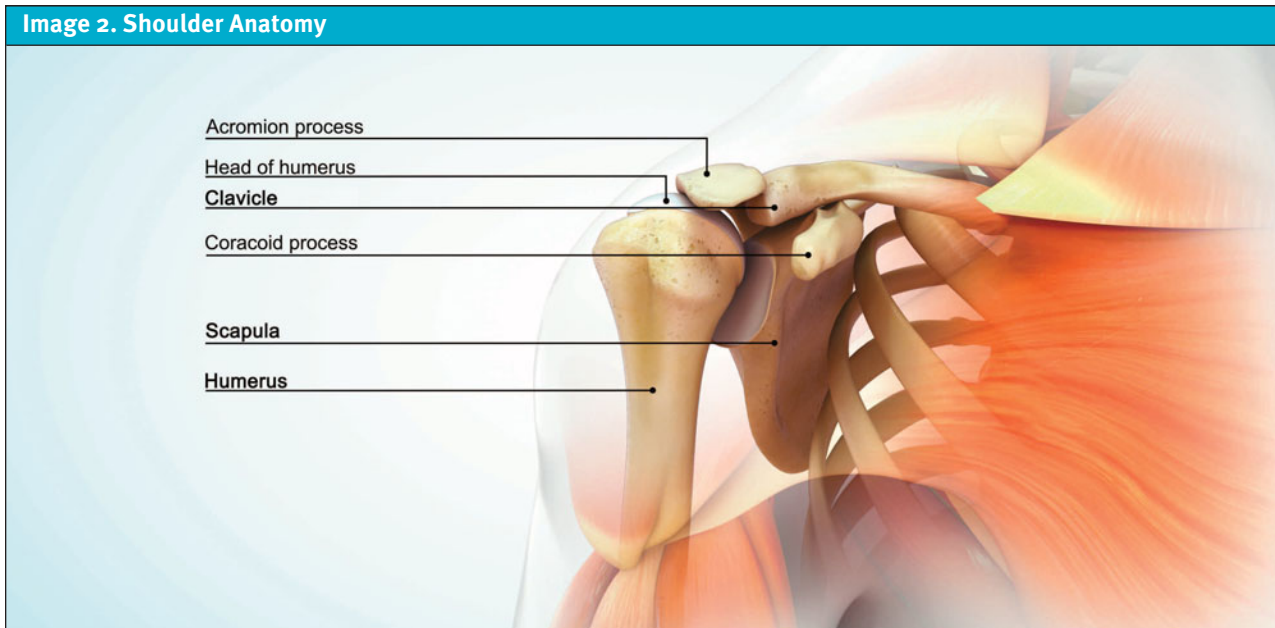
The axillary nerve is the most commonly injured nerve associated with proximal humerus fractures.¹ In most individuals, the axillary nerve travels deep to the deltoid muscle in close approximation to the proximal lateral humerus, making it particularly vulnerable to injury in surgical neck fractures. The blood supply of the proximal humerus is highly variable, but most com-

monly it is supplied by the anterior humeral circumflex artery, which most often originates from the axillary artery. Arcuate arteries form anastomoses with the surrounding vessels, including the posterior humeral circumflex artery, which serves as the primary blood supply to the humeral head in most individuals. This leads to a common phenomenon of retrograde perfusion supplying the small penetrating intraosseous vessels.³

Proximal Humerus Fractures

Proximal humerus fractures are relatively common, comprising 4-6% of all adult fractures.¹ They predominantly affect women and the elderly most commonly after low-energy trauma, such as in the clinical scenario presented. In such cases, these are often termed "fragility fractures,"¹ which alludes to injuries associated with increasing patient fragility. Falls from standing are the most common mechanism for fragility fractures. Multifactorial aspects of fragility contribute to the risk of such falls, such as generalized weakness, osteopenia, impaired balance and/or vision, low body mass index, and female gender. Concurrent substance use disorder increases the risk of fragility fractures.⁴

Proximal humerus fractures do occur in younger individuals, but usually this involves a higher energy trauma mechanism. Younger patients are also much



more likely to suffer glenohumeral dislocations rather than proximal humeral fractures with blows to the upper arm.

In certain cases of dislocation, there can be impaction of the humeral head from impact with the glenoid rim resulting in a Hill-Sachs deformity. While technically a fracture of the proximal humerus, the Hill-Sachs deformity differs significantly from other proximal humerus fracture as it is usually evident in cases of glenohumeral dislocation.⁵ Approximately 50-65% of proximal humerus fractures are minimally displaced injuries to the greater tuberosity or surgical neck, while 20-30% are comminuted fractures of the surgical neck.² Proximal humeral fractures, since they occur predominantly in elderly and frail individuals, are frequently associated with clinically significant injuries to the head, neck, clavicle, elbow, and/or wrist.¹

History

As with all trauma presentations, understanding the mechanism of injury is critical to ensuring an appropriate differential diagnosis and work-up plan are formulated. Additionally, it is important to assess locations of significant pain and what exacerbates the pain, assessing for sensation or motor changes, which may indicate a neurovascular injury. If there is disruption of the skin, it is worthwhile to inquire about the patient's tetanus vaccination history.

Because proximal humerus fractures occur most commonly in elderly patients after a fall, a common pitfall is

“Proximal humerus fractures do occur in younger individuals, but usually this involves a higher energy trauma mechanism.”

to focus on the injury without inquiring about the circumstances surrounding the fall. Inquiring about the possibility of loss of consciousness can lead to identification of seizure or syncope, which may necessitate an entirely separate differential and work-up. While syncope often occurs due to benign causes (eg, orthostasis, vasovagal episodes), the possibility of cardiogenic causes increases with increasing age and comorbidities such as congestive heart failure (CHF) or coronary artery disease. It's important to note that pre-syncope and syncope have the same differential diagnoses, and even patients who did not fully lose consciousness may have had a serious cause for their lightheadedness. They warrant careful history of the symptoms preceding the fall, review of vital signs, and electrocardiogram at a minimum.^{6,7}

Seizure is an alternate cause for sudden loss of consciousness and falls that should be considered. Unlike syncope, patients with seizures often have prolonged rhythmic jerking and are amnesic to the event. Tongue biting, urinary incontinence, and a preceding aura are also more common with seizure, but presence or ab-

sence of these signs and symptoms does not confirm or refute the diagnosis of seizure. However, the presence of a postictal state (ie, slow return to normal awareness) is strongly associated with seizure. Clinically, distinguishing between seizure and syncope, even with inquiry into all the mentioned features, may not always be possible, and neurologist referral and electroencephalogram are sometimes required.⁸ Collateral history from bystanders who witnessed the fall can be very helpful as well. Additionally, assessing for symptoms that preceded the fall, such as headache, nausea, vomiting, weakness, numbness, or visual changes, can be helpful in distinguishing if events, such as cerebrovascular accidents (CVA), may have precipitated the fall.

Additionally, chest pain, shoulder pain, or back pain prior to the fall should be assessed as this may represent acute coronary syndrome (ACS), pulmonary embolism (PE), or aortic dissection (AD). If the patient is having shortness of breath, again ascertaining if it predated the fall may suggest PE or CHF, for example, whereas similar symptoms after the fall might be more suggestive of thoracic injuries such as rib fractures or pneumothorax (PTX).

“In other words, falls in the elderly appear to be a marker for frailty and risk for short term poor outcomes, regardless of etiology.”

In the cases where a medical event is not suspected as causative of the fall, the term “mechanical fall” is often used. It is critical to note, however, that elderly patients who fall for reasons not related to a preceding medical event still benefit from additional data gathering. A 2016 retrospective ED study of patients who presented after a fall showed that there was no difference in 30-day ED revisit, hospitalizations, or death between groups who fell for mechanical and non-mechanical reasons.⁹ In other words, falls in the elderly appear to be a marker for frailty and risk for short term poor outcomes, regardless of etiology. Moreover, mechanical falls may be due to some aspect of the home environment that is unsafe and needs to be remedied to mitigate the risk of future falls. It is crucial to inquire about things like stairs, lighting, and the presence of

assistive equipment (eg, grab bars) in home bathroom facilities to identify sources of risk for falling again.¹⁰

Determining the patient’s dominant hand and level of assistance at home also will be helpful for minimizing risk of additional morbidity associated with their shoulder injury given the necessary loss of use of 1 arm and likely use of potentially sedating medications for pain.¹¹ While not a medical necessity, some patients may require temporary placement in a nursing home or rehab facility when there are doubts about the safety of their ability to function independently without the use their arm.

Ultimately, because the most important aspect of history gathering in patients with suspected proximal humerus fracture surrounds the circumstances that led to the injury, falls in the elderly are often sentinel events that reveal undiagnosed medical conditions and/or unsafe home environments.⁹

Physical Exam

Physical examination of the shoulder should focus on evaluating the integrity of the skin, identifying areas of tenderness, noting ecchymoses and/or deformities. A gentle assessment of both active and passive range of motion (ROM) at the shoulder is appropriate, but pain and spasm often limit this in the acute setting. Inability to tolerate any significant shoulder ROM should be expected. Inspect for the “sulcus sign” characterized by increased inferior translation of the humerus below the acromion on the lateral aspect of the shoulder, which may indicate inferior glenohumeral instability.¹² Examine the elbow, forearm, and wrist for associated injuries and the other extremities for painful ROM, swelling, and deformity.

Evaluate the vascular status by palpating the radial and ulnar pulses and check nailbed capillary refill. Assess axillary nerve function by checking sensation over the lateral deltoid.

Assess for the possibility of associated head, neck, and thoracic trauma. Inspect for swelling and ecchymoses. Palpate the cervical spine assessing for midline tenderness and, if present, use appropriate neck immobilization until a cervical spinal (c-spine) fracture can be excluded. It is important to note that neither NEXUS, nor the Canadian C-spine clinical decision rule allow for clearance of patients over age 65 with midline c-spine tenderness. Trauma expert guidelines recommend computed tomography (CT) of the c-spine over XR in elderly patients.¹³ In UC, this often will necessitate an ED referral by ambulance. Palpate the chest assessing for crepitus and tenderness that might suggest the pos-

sibility of rib fracture, chest wall contusion, and need to obtain imaging to assess for PTX or hemothorax. Finally, do not lose sight of the cause of the patient's injury. Assess the safety and stability of the patient's gait. If there is concern for an acute medical condition (eg, syncope, ACS, PE, CVA) contributing to a fall based on the history, perform appropriate physical examinations to assess for the presence of the underlying conditions in the differential.

Radiography

The primary imaging modality for diagnosing proximal humerus fractures is plain radiography (ie, XR). It is recommended to obtain a true anteroposterior (AP) view of the glenohumeral joint, an axillary view, and a scapular-Y view as the patient can tolerate which assesses both the glenohumeral joint and the proximal humerus.¹⁴ Provide oral analgesia, such as acetaminophen, and an ice pack prior to obtaining XRs to allow for maximal patient comfort and the most appropriate positioning.

Although XR are the initial imaging of choice, occasionally CT may be obtained if operative repair is considered.¹⁴ Point-of-care ultrasound (POCUS) can be utilized as a complementary imaging modality and has high sensitivity and specificity in the hands of experienced operators in diagnosing long bone fractures and determining fracture characteristics. However, POCUS is not commonly available in UC settings, and XR usually is able to identify most proximal humerus fractures (**Image 3**).¹⁵ While magnetic resonance imaging (MRI) is rarely indicated, it may ultimately be considered by a specialist seeing the patient for follow-up if there is concern for associated rotator cuff injuries.¹⁴

Two main classification systems exist to categorize proximal humerus fractures: the Neer classification; and the AO (*Arbeitsgemeinschaft für Osteosynthesefragen*) classification.¹⁴

- The Neer classification categorizes fractures based on the number of separated anatomical segments. Separation is defined as angulation greater than 45° or displacement >1 cm. This system accounts for deforming forces, vascular status of the fragments, and continuity of the articular surface.¹⁴
- The AO classification divides proximal humeral fractures into 3 groups (A-C) based on the number of fracture parts, with further subgroups specifying the anatomic location of the fractures.¹⁴ This system also assesses the risk of avascular necrosis, with group A having the lowest risk and group C the highest.¹⁴

Image 3. Proximal Humerus Fracture With Displaced Greater Tuberosity



Management in Urgent Care

Provide analgesics, a shoulder sling, and ice pack immediately as able and obtain appropriate imaging as discussed. After identifying a proximal humerus fracture on XR and clinically excluding significant other injury or acute underlying medical issues that would require immediate ED referral, it is appropriate to focus on treatment of the patient's shoulder injury. The immediate treatment of proximal humerus fractures depends on the severity and type of fracture as well as the presence of complications. Open fractures and those with neurovascular involvement, though rare, should be immediately referred to an ED.¹⁶ ED referral is also warranted if there is suspicion for elder abuse.

Fractures with mild and even moderate displacement are typically treated nonoperatively.¹⁷ The 2015 ProFHER (PROximal Fracture of the Humerus: Evaluation by Randomisation) trial, a randomized multi-center study of 250 patients with displaced proximal humerus fractures, compared surgical and non-surgical treatments and found no significant difference in functional outcomes between surgical and non-surgical groups. However, the surgical group experienced more medical complications compared to those treated conservatively, suggesting risks beyond surgical complications need to

be considered in this generally frail group of patients who often have multiple co-morbidities.¹⁷

Conservative management consists of the use of a simple shoulder sling for 4-6 weeks and early physical therapy (PT). Pendulum and passive range of motion exercises should begin as soon as pain allows to maintain ROM and prevent stiffness.¹⁸ The sling can generally be removed for bathing and hygiene. Active ROM and strengthening exercises will be guided by PT and orthopedics. The main risks of nonoperative management include osteonecrosis, non-union or malunion, joint stiffness, and rotator cuff dysfunction.¹⁹

“Patients discharged from UC should be urgently referred for outpatient orthopedic evaluation and PT.”

For patients that can be safely discharged from UC, ensuring adequate home support and analgesia are primary considerations. Oral opioid analgesics (eg, hydrocodone, oxycodone etc.) have been considered integral to the treatment of pain associated with fractures. However, increasing awareness of opioid use disorders has prompted consideration for opioid sparing strategies for post-traumatic pain management.²⁰ Further caution is warranted when prescribing opioids to older patients, particularly those who may have fallen due to balance issues and/or intoxication, as opioid use can exacerbate fall risk. Non-steroidal anti-inflammatory (NSAID) agents (eg, naproxen and ibuprofen) are effective analgesics, but concerns in the orthopedic community have been raised regarding NSAID use and impaired fracture healing. However, there is growing evidence that NSAID use likely does not impair bone healing to a clinically relevant degree, with a 2020 observational study even showing a greater risk of malunion among patients taking opioids and not among those taking non-selective NSAIDs.^{21,22} This has led to adoption of a recommendation for use of NSAIDs as a primary analgesic class for treatment of acute fracture related pain by the Eastern Association of Surgeons for Trauma (EAST) in their updated 2023 guidelines.²⁰ It is important to assess for contraindications for NSAIDs, especially in elderly patients, and use the safest agent, at the lowest dose, for the

shortest duration possible.²³ The preponderance of current evidence supports a multimodal analgesia (ie, combining classes of analgesics for synergy) strategy as the most safe and effective for fracture pain management.²⁴ This strategy complements a tiered approach which emphasizes initial pain management strategies should be non-pharmacologic (eg, ice, sling) and then adding pharmacologic agents in order of their safety profiles.²⁵

In proximal humerus fractures, for example, such a pain management strategy could consist of using ice or heat liberally with acetaminophen 1,000mg every 8 hours. Naproxen 250-500mg once or twice daily could then be added if necessary followed by a low dose of oxycodone (eg, 2.5-5mg) as needed for breakthrough pain for the first 3-5 days after injury. Patients discharged from UC should be urgently referred for outpatient orthopedic evaluation and PT. Additional pain management can be deferred to the orthopedist as they would ideally be seeing the patient for follow-up within 5 days. This is also the best setting for further discussions surrounding any need for additional imaging and the risks and benefits of surgical fixation.

Disposition and Outcome

The patient was able to ambulate safely and felt comfortable going home with his daughter. He was placed in a simple shoulder sling, prescribed hydrocodone for breakthrough pain, and referred to orthopedics. Two days later, his daughter found him on the floor and minimally responsive. He was intubated for airway protection and taken to the local ED where a stat head CT demonstrated a large subdural hemorrhage. He also had laboratory evidence of rhabdomyolysis with evidence of acute renal failure. His blood ethanol level was found to be 0.15% at the time of his presentation. After a prolonged inpatient course involving neurosurgical intervention and aggressive intravenous fluid administration, his acute kidney injury resolved and his mental status improved. He remained confused, however, and therefore was discharged to a skilled nursing and rehabilitation facility.

His proximal humerus fracture was treated nonoperatively. He remained in a sling for 4 weeks and received progressive PT to gain strength and ROM while in the facility.

Takeaways for Urgent Care

- Proximal humerus fractures most commonly occur in older patients after a fall onto their shoulder.
- Assess the shoulder and remainder of the upper extremity for associated injuries.

- The axillary nerve is the most likely neurovascular structure to be injured in the setting of proximal humerus fracture. Screening for axillary nerve injury can be accomplished by assessing sensation over the lateral deltoid.
- Both displaced and nondisplaced proximal humerus fractures are typically managed conservatively with a simple shoulder sling, early passive ROM, and physical therapy.
- XR imaging can usually confirm the presence of a proximal humerus fracture. Additional imaging is rarely indicated in the acute setting.
- If the injury is caused by a fall, consider acute medical issues and substance use that can affect balance and evaluate as appropriate based on history and physical exam.
- Specifically evaluate for associated head and c-spine injuries. Elderly patients are at risk for intracranial hemorrhage and c-spine fractures with relatively low-mechanism trauma. Have a low-threshold for ED referral if there is associated head trauma or c-spine tenderness.
- Treat patients with tiered, multimodal analgesia and limit opioid prescriptions to a short-course for breakthrough pain.
- Proximal humerus fractures can be sentinel events for elderly and frail individuals that offer an opportunity to identify undiagnosed medical conditions or unsafe home environments. A diligent assessment of the patient's baseline status, function, and home environment after can reduce subsequent morbidity and mortality. ■

Manuscript submitted September 18, 2024; accepted October 3, 2024.

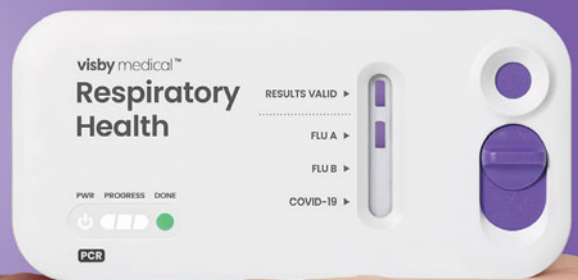
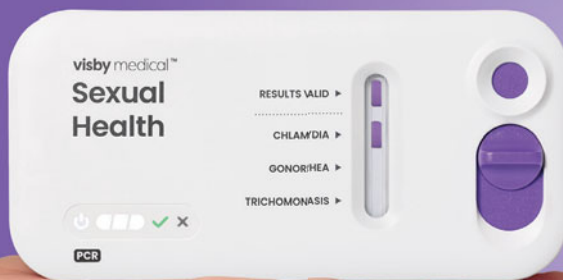
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Urinary Retention Caused by a Urethral Stone Diagnosed with Point-of-Care Ultrasound: A Case Report

Urgent Message: Urethral obstruction can occur due to impacted urinary calculi. This etiology should be considered in patients with known or suspected history of kidney stones who present with urinary retention. Point-of-care ultrasound can be used to evaluate for and confirm this diagnosis in male patients, in whom the phenomenon is most likely.

Nicholas Maenza, DO; Jeffrey Darko, MD

Citation: Maenza N, Darko J. Urinary Retention Caused by a Urethral Stone Diagnosed with Point-of-Care Ultrasound: A Case Report. *J Urgent Care Med.* 2024; 19(2): 21-24

Abstract

Introduction: Nephrolithiasis may lead to passage of calculi that can become lodged in the penile urethra and lead to urinary retention. This is traditionally a diagnosis made with computed tomography (CT), x-ray (XR), or retrograde urethrography.

Clinical presentation: A 69-year-old man presented to urgent care (UC) after he developed flank pain, hematuria, and urinary retention. As his symptoms progressed, he later developed penile pain.

Case Resolution: Point of care ultrasound (POCUS) showed a small hyperechoic mass in the penile urethra. Urethral stones can be managed with watchful waiting, milking of the stone, or in our case, placement of a catheter.

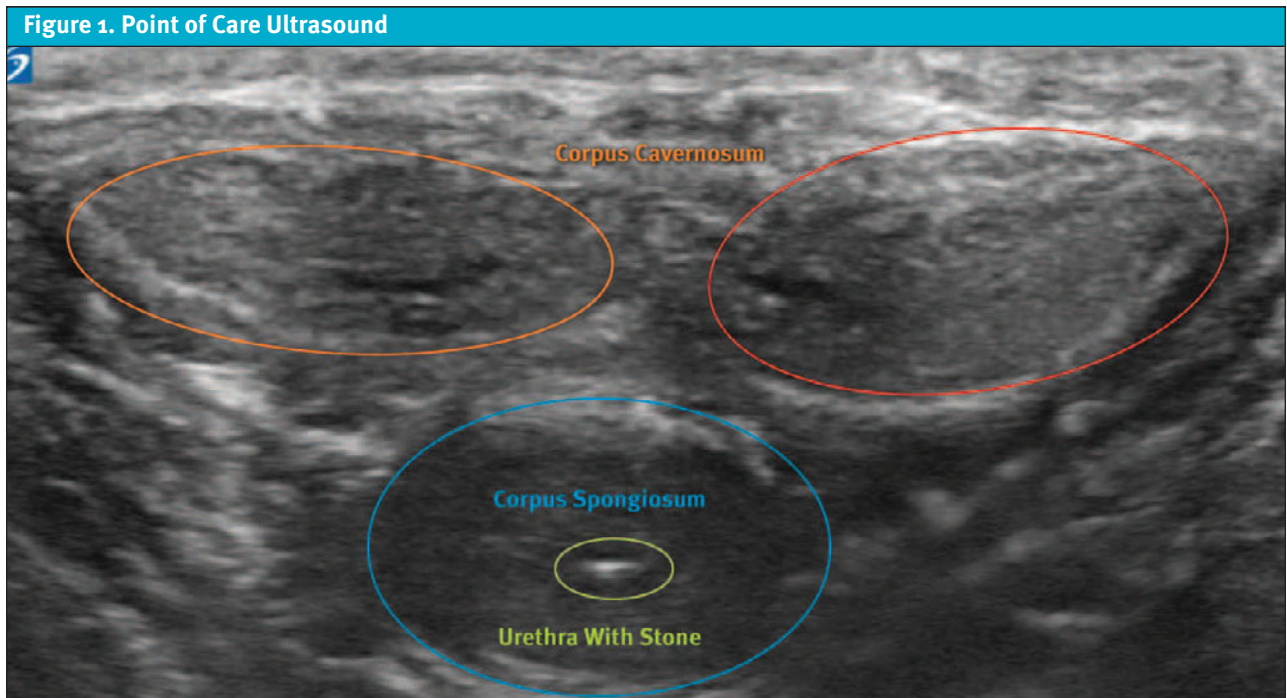
Conclusion: POCUS is a useful adjunct that should be considered in patients with suspected urethral or penile stones. It can provide a quick reliable diagnosis and forgoes radiation.



Introduction

Diagnostic ultrasound's utility in the evaluation of the urinary system (ie, kidneys and bladder) has been well established.¹ However, in patients with acute flank pain in which there is clinical concern for ureteral colic, CT imaging, especially in emergency department

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(ED) settings, is commonly performed as the initial imaging modality, despite evidence that CT confirmation in cases of likely ureterolithiasis often does not affect management.² If a urinary calculus becomes lodged in the penile urethra, an x-ray or retrograde urethrography can also be used to aid in diagnosis.³ When available, POCUS can be a useful tool in the evaluation of patients with suspected renal colic and penile pain and reduce radiation exposure without delaying care or affecting patient outcomes.⁴

“POCUS can be a useful tool in the evaluation of patients with suspected renal colic and penile pain.”

Clinical Presentation

A 69-year-old man with a past medical history for nephrolithiasis, hypertension, and prostate cancer (in remission after radiation therapy) presented to UC with a 1-day history of flank pain, suprapubic pressure, hematuria, urinary dribbling, and the sensation of incomplete bladder emptying. He denies any vomiting,

fevers, nausea, vomiting, or testicular pain. He reported that the pain began in the right flank but became more prominent in the suprapubic area and penile shaft on the day of his presentation. Current medications included tamsulosin 0.4mg daily and losartan 25mg daily.

Physical Exam Findings

In general, the patient appeared uncomfortable but non-toxic. His vitals were normal except for a mildly elevated blood pressure (158/82), and he was afebrile. On abdominal exam, the patient had tenderness and suprapubic fullness; the remainder of the abdomen was nontender without rigidity, rebound, or guarding. Assessment of the back revealed minimal bilateral costovertebral angle tenderness.

Urgent Care Diagnostic Assessment, Case Conclusion

Using a 12-3 MHz linear probe and 5-1 MHz curvilinear probe, POCUS was performed evaluating the bladder, kidneys, and penile shaft. Imaging of the kidneys showed moderate, bilateral hydronephrosis. There was no echogenic material (eg, clot) noted in the bladder. However, the bladder appeared distended, and the ultrasound estimated volume of urine was approximately 700mL. Using a 12-3 MHz linear probe, the penile shaft was then scanned in the short axis. The corpus cavernosum and corpus spongiosum appeared isoechoic (ie, grey). Within the center of the corpus spongiosum, the

urethra was seen and appeared as a small anechoic (ie, black), compressible structure. As the length of the penile shaft was scanned, a small 3mm hyperechoic (ie, white) finding was noted (**Figure 1**). The location of the stone on POCUS exam correlated with the location of the patient's pain. Based on the clinical presentation, an impacted, obstructing urethral stone within the penile urethra was suspected.

Given the evidence of urinary obstruction, after discussion with urology, a 16Fr Coudé tipped Foley catheter was placed. The placement of the catheter allowed the urethral stone to be reduced back into the bladder. A leg bag was placed, and he was then referred to urology as an outpatient for further assessment and determination of timing of catheter removal and stone management.

Discussion

Urinary calculi which are small enough to pass through the ureter and into the urethra usually pass without the need for intervention.⁵ Stones sized 1-4mm are passed through the urethra at a rate of around 78%.⁵ Urethral stones are more commonly observed in men, accounting for approximately 82% of cases. The reason for this higher prevalence in men is not entirely clear. However, it may be related to the fact that urethral stones in women are often associated with an underlying urethral lesion, which is present in 77% of female cases, compared to 24% in men.⁶ Pain in the penile shaft is typically caused by the abrasive nature of the stone as it passes through the urethra. The most common symptom is a palpable mass, occurring in 68% of cases, with other frequent symptoms including voiding difficulties, pain, urinary retention, and hematuria.⁶

The diagnosis of urethral calculi can be made with XR, CT, or XR urography.³ However, all of these imaging studies are associated with radiation exposure and may not be available in UC. Additionally, not all stones are radiopaque. Pure uric acid stones and stones composed of mainly cystine or magnesium ammonium phosphate may be undetectable on radiographs.⁷ Ultrasound is a highly sensitive modality for evaluating for the presence of foreign bodies and is superior to XR for detection of radiolucent foreign bodies.⁸ Thus, although the sensitivity of ultrasound for urethral stones has not been studied, it is a reasonable initial imaging study in UC—if available—as it is quick, radiation-free, and can detect both radiolucent and radiopaque objects.

Previously published case reports have discussed the value and utility of POCUS in detecting urethral stones.^{9,10} Other studies have shown how the use of

POCUS as the initial imaging modality for suspected renal colic could yield significant national cost savings and reduced ED lengths of stay without adverse outcomes for patients.^{2,11,12} By incorporating POCUS into the diagnostic workup for suspected urethral calculi, UC clinicians could effectively reduce unnecessary radiation exposure without compromising the diagnostic accuracy or patient care. Depending on the stone's size, it can present simply as a hyperechoic mass or a larger mass with an acoustic shadow.¹³

“The diagnosis of urethral calculi can be made with XR, CT, or XR urography. However, all of these imaging studies are associated with radiation exposure and may not be available in urgent care.”

Urethral calculi are the rarest form of urolithiasis, and as a result, there are no established best-practice consensus guidelines for their management.³ Many urethral stones pass spontaneously, and allowing for this possibility is reasonable in patients who can adequately void.³ For stones in the distal urethra, described as stones in the palpable urethra, “milking” the shaft of the penis has also been reported to lead to successful stone expulsion in several cases.⁶ If there is complete obstruction of the urethra, patients may require urethral catheterization to reduce the stone into the bladder to allow for passage of urine, as was the case with the patient presented in this case.³ In cases where urinary retention cannot be resolved in UC, immediate referral to an ED is recommended to prevent permanent renal insufficiency.¹⁴

Conclusion

This case highlights the use of POCUS in confirming the diagnosis and location of a urethral calculus in a male patient with suggestive symptoms. It also underscores the value of POCUS as an affordable and readily-available, radiation-free modality for locating soft tissue foreign bodies.

Ethics Statement

The patient provided verbal consent for case description and clinical images to be used for education purposes.

Takeaway Points for Urgent Care Providers

- In patients who present with suspected urinary retention, POCUS can provide rapid confirmation of a distended bladder. If additional views of the kidneys demonstrate bilateral hydronephrosis, clinicians can use POCUS to search for causes of obstruction in the distal urinary tract and urethra of male patients.
- In patients who initially have symptoms of renal colic who then progress to having penile pain, POCUS can quickly evaluate for the presence of a urethral calculus.
- Urethral stones causing obstruction can be treated by attempting to expel them by milking (from proximal to distal) the penile shaft or by reducing the stone into the bladder via urinary catheter placement. ■

Manuscript submitted May 24, 2024; accepted September 19, 2024.

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Puffy Hand Syndrome: A Case Report

Urgent Message: Incorporating questions regarding the use of intravenous drugs may help ensure the diagnosis of puffy hand syndrome is included in the differential for patients presenting with bilateral hand swelling.

Ifrah Majeed, DO; Kenneth VanDyke, DO

Citation: Majeed I, VanDyke K. Puffy Hand Syndrome: A Case Report. *J Urgent Care Med.* 2024; 19(2): 25-27

Abstract

Introduction: Bilateral hand swelling is a common presentation in a variety of conditions, particularly rheumatological disorders. Urgent care (UC) providers can avoid unnecessary testing if they are able to recognize that patients with a history of intravenous and injection drug use (IVDU) can present with this pattern of swelling—termed “puffy hand syndrome.”

Clinical Presentation: A 35-year-old female with a history of IVDU, hepatitis C, and tobacco use presented with redness and swelling of her bilateral hands for greater than 1 year. She reported some mild, generalized stiffness of her hands that got worse with heat but denied focal swelling or pain of any particular joint.

Physical Exam: The patient was afebrile. Examination of her bilateral hands demonstrated diffuse erythema when compared to her forearms without warmth and generalized non-pitting edema. There were stigmata of frequent injections scattered on her upper and lower extremities.

Case Resolution: Based on the duration of her symptoms, lack of history and findings specific for Raynaud’s syndrome, systemic lupus (SLE), scleroderma, or inflammatory arthritis, a presumptive clinical diagnosis was made of puffy hand syndrome related to her known history of IVDU.

Conclusion: Puffy hand syndrome should be suspected



in patients with bilateral non-pitting, painless edema of the hands. Including this diagnosis in the differential can mitigate emergency department (ED) referrals. Patients with suspected puffy hand syndrome can generally be counseled of the likely diagnosis and follow-up with a primary care provider (PCP) or rheumatologist to determine what, if any, confirmatory testing is indicated.

Introduction

Many conditions can present with bilateral hand swelling, particularly rheumatological disorders. The differential diagnosis for this presentation is broad and the finding can be a manifestation of a serious underlying disorder such as heart failure, liver failure, nephrotic syndrome, or infection (eg, cellulitis).¹ It can also be seen after lymph node removal in the axillary region if done bilaterally.² Consideration must also be given for

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Figure 1. Bilateral Diffuse Puffiness Without Pitting

various autoimmune and inflammatory conditions, such as rheumatoid arthritis, polymyalgia rheumatica, remitting seronegative symmetrical synovitis with pitting edema, crystal arthropathies (eg, gout or calcium pyrophosphate deposition disease), scleroderma, mixed connective tissue disease, and SLE.³ This case report describes a 35-year-old female with a history of injection and IVDU who presented with chronic bilateral hand puffiness and swelling.

Case Presentation

A 35-year old female with a history of IVDU, hepatitis C, and tobacco abuse presented with redness and swelling of her hands for greater than 1 year. She reported some mild and generalized stiffness to her hands that got worse with heat but denied swelling or pain to a particular joint. She denied recent trauma, fevers, photosensitive rashes, oral/nasal ulcerations, dry eyes or dry mouth, chest pain, triphasic discoloration to her hands or feet, digital ulcerations, and history of miscarriages.

Physical Exam Findings

The patient was afebrile, and her vitals were normal/unremarkable. She was generally well nourished and in no distress. Her mucocutaneous exam was negative for

telangiectasias, digital pitting or ulcerations, and periungual erythema, and the nailfold capillary exam was normal. Examination of her extremities of her bilateral hands was significant for diffuse erythema without warmth when compared to her forearms and the remainder of her upper extremities. Generalized non-pitting edema restricted to the hands was noted. Incidentally, there were scattered scars on her upper and lower extremities consistent with her stated history of IVDU. Her joint exam showed no focal swelling/effusions, and her range of motion of all joints was grossly normal.

The patient was referred to a rheumatologist in this case who initiated a broad screening rheumatologic work-up antinuclear antibody; ribonucleoprotein; hepatitis C antibody; rheumatoid factor; sedimentation rate; and C-reactive protein. The results of these tests were non-specific and did not suggest a clear autoimmune diagnosis. The patient declined further lab testing given the difficulty of venous access.

Based on the longevity of her symptoms, lack of history, and findings specific for Raynaud's syndrome, SLE, scleroderma, or inflammatory arthritis, a more benign process was believed to be most likely. As such, a presumptive diagnosis of puffy hand syndrome due to IVDU was made.

Discussion

Puffy hand syndrome associated with IVDU is a clinical diagnosis of exclusion based on a suggestive history and after consideration of other etiologies that may be progressive without treatment (eg, SLE, inflammatory arthritis, etc.). It typically occurs in patients with an extensive history of IVDU and is likely underdiagnosed.¹ While the differential for swollen hands is broad, the history, duration of symptoms, and clinical exam often strongly suggests the diagnosis. Incorporating questions regarding IVDU is critical for determining the likelihood of puffy hand syndrome.

Pathophysiology and Risk Factors

The suggested pathogenesis of puffy hand syndrome is that repeated trauma from venipuncture and injection of caustic substances can produce vascular and dermal sclerosis, which over time obstructs venous return.¹ It is also hypothesized that the history of injection of toxic substances can damage and impair lymphatic drainage of the hands as well.^{4,5} Repeated, subcutaneous and skin infections from non-sterile injection practices may also play a role in compromising the upper extremity's lymphatic system and impede lymphatic drainage. In patients who undergo diagnostic testing with puffy hand syndrome, lymphangiograms typically show the presence of collateralization due to destruction of deep channels of venous drainage. Additionally, skin biopsies show extensive fibrosis.⁶ In 1 study, findings of musculoskeletal ultrasound in puffy hand syndrome suggested the only expected abnormal finding to be diffuse, subcutaneous edema.⁵

Diagnosis

The diagnosis of puffy hand syndrome is made after excluding other possible etiologies such as rheumatoid arthritis, polymyalgia rheumatic, remitting seronegative symmetrical synovitis with pitting edema, crystal arthropathies such as gout or calcium pyrophosphate deposition disease, or autoimmune connective tissue diseases such as scleroderma, mixed connective tissue disease, and lupus.³

Urgent Care Management

Management involves a similar approach that is used in lymphedema treatment, including long term use of low-stretch bandages and elastic compression gloves.⁷ The patient should stop use of IV drugs permanently. Referral to physical therapy can also help with lymphedema management.¹ Puffy hand syndrome can persist even after a person stops injecting drugs. One case

described a patient with IVDU who stopped drug use and 1 year later developed his initial episode. Three years later, he developed his second episode.⁸

Case Resolution

In this case, the rheumatologist believed that given the unremarkable and non-specific rheumatologic screening work-up, a diagnosis of puffy hand syndrome was most likely.

Ethics Statement

The patient provided verbal consent for publication of this case.

Takeaway Points

- An underappreciated complication of IVDU is puffy hand syndrome. It should be suspected in patients with bilateral non pitting, painless edema with substantial history of IVDU.
- Incorporating questions regarding the use of intravenous drugs may help to ensure the diagnosis is included in the differential.
- Recognition of this syndrome can prevent patients from undergoing unnecessary interventions and treatments.
- Treatment of puffy hand syndrome involves use of low stretch bandages and elastic compression gloves, as well as counseling and support to prevent ongoing IVDU. ■

Manuscript submitted July 8, 2024; accepted September 23, 2024.

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How Should an Urgent Care Handle Requests for Medical Records by Subpoena?

Urgent Message: Urgent care centers need documented, consistent, and reportable processes for receiving, tracking, responding to, and collecting payment on subpoenas for patient medical records.

Alan A. Ayers, MBA, MAcc

Citation: Ayers A. How Should an Urgent Care Handle Requests for Medical Records by Subpoena? *J Urgent Care Med.* 2024; 19(2): 29-32

Medical records are the critical foundation of a compelling personal injury case. These documents are the way in which a plaintiff's attorney can prove their case by providing this evidence of their client's injuries, treatment, and recovery.¹ The legal term for a records request is *subpoena duces tecum*, which is Latin for "bring with under penalty of punishment." This type of subpoena compels the production of specific medical records or other documents by a specific date.² Urgent care centers may receive such subpoenas.³ This article isn't designed to address routine protected health information (PHI) release under HIPAA but instead will examine circumstances when an urgent care center receives a subpoena arising from litigation.

HIPAA Privacy Rule

A request for specific medical records often pertains to a medical malpractice action that may be filed against the urgent care or a healthcare provider, for example, or a motor vehicle personal injury lawsuit, a life insurance claim, workers compensation benefits, or other circumstances. Regardless of what the attorney requests, as a HIPAA covered entity, an urgent care must comply with the HIPAA Privacy Rule when responding to subpoenas for medical records. Under the HIPAA Privacy



Rule, medical practices and other covered entities must safeguard PHI contained in patients' medical records. When an urgent care receives a subpoena requesting medical records, it must analyze the subpoena to determine if it meets Privacy Rule protections. If it fails to do so, HIPAA prohibits the disclosure of the record.⁴

A Patient's Right to Privacy

The California Supreme Court stated that even highly relevant, nonprivileged information may be shielded

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from discovery if its disclosure would impair a person's "inalienable right of privacy" provided by California Constitution Article 1, section 1.⁵

The framework for evaluating invasions of privacy in discovery was clarified by the Supreme Court in 2017. In *Williams v. Superior Court*,⁶ the Court held that, generally, "[t]he party asserting a privacy right must establish a legally protected privacy interest, an objectively reasonable expectation of privacy in the given circumstances, and a threatened intrusion that is serious.⁷ The party seeking information may raise in response whatever legitimate and important countervailing interest disclosure serves, while the party seeking protection may identify feasible alternatives that serve the same interests or protective measures that would diminish the loss of privacy. A court must then balance these competing considerations."⁸

"Typically, if the subpoena is signed by a judge and is issued in a court proceeding, it must be honored."

In *Britt v. Superior Court*,⁹ the plaintiffs—who were owners and residents of homes located near the San Diego International Airport who claimed injury caused by airport operations—challenged the trial court's discovery order that compelled them to disclose to the defendant *their entire lifetime medical histories*. The plaintiffs argued that "while they are completely willing to provide defendant with medical information which relates in any way to the physical or emotional injuries for which they seek recovery in the underlying action and, indeed, that they have already done so they object to the trial court's unlimited order which requires them to comply with defendant's request for information related to all past medical conditions, without regard to whether such conditions have any bearing on the present litigation."⁹

The defendant argued in response that the broad discovery order properly afforded it the opportunity to determine for itself whether the injuries, which the plaintiffs asserted were caused by airport operations, actually arose from other medical conditions.¹⁰

In overturning the trial court's discovery order, the California Supreme Court held that the plaintiffs were not obligated to sacrifice all privacy to seek redress for a specific physical, mental, or emotional injury. While they could not withhold information that related to any physical or mental condition that they brought up in the lawsuit, they were entitled to retain the confidentiality of all unrelated medical or psychotherapeutic treatment they may have undergone in the past.¹⁰

As a result, the trial court erred in ordering the plaintiffs to disclose their entire lifetime medical histories. This aspect of the challenged discovery order was vacated.¹¹ The California Supreme Court held that a trial court cannot order disclosure of a party's healthcare records unless the records are *directly relevant* to the issues put forward in the action.¹¹

However, some states have what is known as a "patient-litigant exception," which is a legal exemption that allows for the disclosure of a "communication or record relevant to an issue of the physical, mental, or emotional condition of a patient in any proceeding in which any party relies upon the condition as a part of the party's claim or defense."¹²

When to Comply With Subpoenas

Urgent care operators should note that a valid subpoena will include the following pieces of information:

- The name of the court issuing the subpoena and the case docket number (usually time and date stamped with the name of the clerk of court)
- The name, address, and contact information of the attorney and law firm that issued the subpoena
- The names of the parties in the legal proceeding.¹³

Attorneys have certain requirements they must meet before issuing a subpoena. When an attorney files a subpoena for medical records, the records cannot legally be released unless one of the following is true:

- The individual issuing the subpoena has notified the patient of the subpoena and explained their right to object. They must provide a written statement and supporting documents that prove this. If there are no objections, the healthcare provider may release the records.¹⁴
- All parties involved in the legal action have agreed to a qualified protective order.¹⁵ The individual issuing the subpoena must provide a written statement and supporting documents that prove this
- The patient has signed a HIPAA authorization for the release of the specific medical records outlined in the subpoena.¹⁴

If the subpoena isn't valid, no response is required.

An urgent operator or provider should ask an experienced attorney as to whether the subpoena is valid.¹⁶ Typically, if the subpoena is signed by a judge and is issued in a court proceeding, it must be honored. And the requested health information must be provided. However, urgent cares may object by writing to the court specifying the grounds for objection.¹⁶

The urgent care is only permitted to disclose the information *specifically* stated in the subpoena and no more. Note that if other information is provided, it would be an impermissible disclosure of PHI. So, if a subpoena requests a patient's clinic records for a specific date, that is all that the urgent care should deliver—not the entire medical record.

Personal information such as the patient's Social Security number, address, phone number, bank account or credit card numbers, should be redacted if that information isn't needed to comply with the subpoena.¹⁷

Urgent care operators should be aware that in a civil case, state law will frequently provide for advance notice. This requires attorneys requesting disclosure of PHI pursuant to a subpoena to provide advance notice to the healthcare provider and the individual whose PHI is requested (or his or her attorney) that the subpoena request is imminent. That way, the person or physician has a chance to seek a protective order from the court to prevent the disclosure from happening.¹⁸ However, in criminal cases, there's no advance notice requirement.

How Can Medical Records be Transmitted?

There's no specific way that the law requires subpoenaed medical records to be delivered. But keep in mind that HIPAA requires that a healthcare provider have some level of security in place to safeguard this information. Sending medical records via email is not secure as emails can be intercepted and read by unauthorized parties. Emails can also be forwarded to unintended recipients, resulting in breaches in confidentiality.¹⁹

A secure patient portal is convenient for patients to track their doctor's appointments, test results, billing and insurance information, prescriptions, and diagnoses as well as communications with their healthcare providers.²⁰ However, patient portals are only practical for the patient to retrieve his or her own records, not to facilitate medical record requests by third parties.

Finally, while somewhat old school, faxing still offers useful features for transmitting medical records. Chief among these is end-to-end security. Many online faxing services now allow for password protection to secure the document at the endpoints, as well as dual-layer

Technology Solutions Can Facilitate Management of Records Requests

When the document request process is not a core part of clinic operations or revenue cycle management, subpoena requests may be poorly managed, which can create risk for non-compliance with a court order. There are now web-based services focused specifically on this situation, which can reduce friction by:

- Enabling attorneys and others to submit document requests electronically in one centralized location, thus assuring the request is received, versus requests coming in through multiple channels (including certified mail to clinic locations, which can result in delays and lost orders)
- Ensuring consistency in the request format and required elements (including HIPAA authorization or court order) and consistency in staff review and acceptance or rejection of requests, assuring compliance with the HIPAA standards described in this article
- Consolidating all activity related to requests into one place, versus recording activity in individual patient charts or paper processes which aren't tracked, enabling operators to see and run reports on all communication related to the status, history, and disposition of requests received
- Tightening controls over invoicing and payment processing (By enabling online payment by credit card, the portal eliminates time-consuming invoicing, collections, receipt and deposit of checks, and other tasks. Invoicing through the portal also eliminates inefficient back-and-forth regarding fees, and assures payment is received in full before records are turned over.)
- Encrypting transmission of records across a secure, certified platform using multi-factor authentication in one standard format, versus converting records to different media and sending through different channels (Digital transmission also assures the correct party receives the record, and the system provides an audit trail of who sent and received records, when, and from what IP address.)

Furthermore, some vendors offer medical records retrieval as an outsourced service by connecting to the urgent care's electronic medical record and receiving and responding to requests on behalf of providers. Others have established networks of requesters (ie, law firms, insurance companies and government agencies) linked through their websites to networks of participating healthcare facilities (including urgent care centers) creating a secure, transactional marketplace.

encryption to safeguard it during transmission.²¹

In addition, it's prudent for urgent care operators to keep a copy of what was produced pursuant to the subpoena and note how and when it was sent.

Charging Administrative Fees

When providing records, an urgent care may charge copy fees as it would with any other request for records.²² HIPAA permits charging a reasonable, cost-based fee for copies and for summaries and explanations of the record.²³ The fee may include only the cost of certain labor, supplies, and postage.²³ Because plaintiff attorneys have been known to hold invoices indefinitely, until a settlement is received, it's best to require payment in advance of sending the records.

“It's best to require payment in advance of sending the records.”

When a Request is Challenged

An urgent care that has been issued a subpoena may also receive a copy of a motion to quash when the patient wants to have the request limited or denied.²⁴

A motion to quash is a formal request made to a court to declare a specific proceeding, such as a subpoena, as invalid or void. The purpose of filing a motion to quash is to challenge the legal sufficiency or validity of the document or proceeding in question. When a motion to quash is filed, the court will review the arguments and evidence presented by the party filing the motion, as well as any opposing arguments. The court will then decide whether the motion is granted or denied.²⁵

Takeaways

- Remember that when attorneys request and use medical records in court, HIPAA laws still take precedence. Legal HIPAA-covered entities can share only medical information immediately relevant in court, and this varies in every case.
- Any subpoena received by an urgent care operator should be carefully reviewed to check the validity of the subpoena, the scope of the request, and the deadline for complying. If the subpoena is issued from a court in another state, it may not be valid in the operator's state.

- A subpoena should not be ignored. Questions about what information to release should be considered by legal counsel. ■

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Development of a Positive Urinalysis Criteria Using a Machine Learning Approach

Urgent Message: There are no consensus definitions for what defines a “positive” urinalysis in the pediatric population. This secondary analysis of data from a quality improvement project in a network of pediatric urgent care centers used a machine learning approach to determine which variables on urinalysis most strongly predict a subsequently positive urine culture.

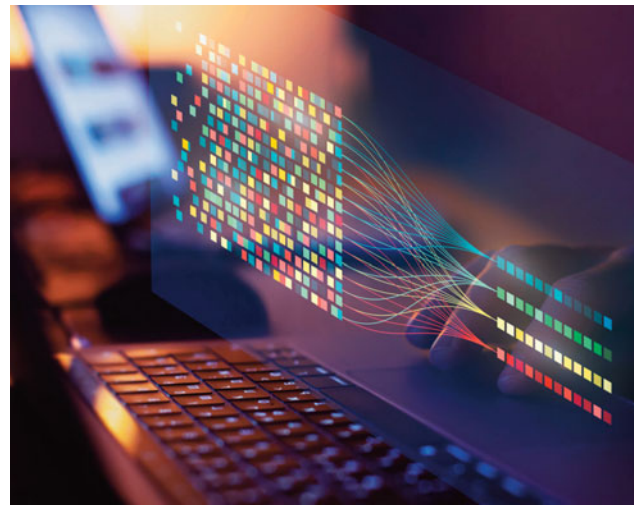
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Citation: Flicker K, Parrott J, Speerhas T, Vazifedan T, Guins T, Bobrowitz J, McEvoy A, Eves J, Conrad D, Klick B. Development of a Positive Urinalysis Criteria Using a Machine Learning Approach. *J Urgent Care Med.* 2024; 19(2): 35-43

Abstract

Background: Urinary tract infections (UTIs) are a commonly encountered diagnosis at pediatric urgent care (UC) centers. The urinalysis (UA) is usually the initial study in UC settings used to guide decisions regarding initiating empiric antibiotics and/or pursuing urine culture. However, studies in pediatric UC settings examining the ideal threshold for a positive result are lacking.

Methods: UA result data were extracted from the records of 6,327 pediatric patients, which were collected as part of a previous QI project. Logistic regression was used to determine the predictors of positive urine cultures. Decision trees for a positive UA result for both clean catch and catheterized specimens were created, and test performance and characteristics were assessed.



Results: The presence of a positive nitrite result was found to be a strong predictor for a positive urine culture. For nitrite negative in specimens obtained by catheterization, the presence of leukocyte esterase (LE) and ≥ 5 white blood cells per high powered field (WBC/HPF) had the greatest accuracy. For clean catch spe-

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Table 1. Initial Models	
Model	Description
1.	Completely negative urine: no blood and no LE and no WBCs and negative nitrites and no bacteria
2.	Any positive values: any blood or any LE or any WBCs, or positive nitrites or any bacteria
3.	2011 AAP UTI guidelines: any LE or positive nitrites or at least 5-10 WBCs or any bacteria
4.	Modified 2011 AAP UTI guidelines: at least moderate LE or positive nitrites or at least 5-10 WBCs or any bacteria
5.	2011 AAP UTI guidelines without bacteria: any LE or positive nitrites or at least 5-10 WBCs
6.	Modified 2011 AAP UTI guidelines without bacteria: at least moderate LE or positive nitrites or at least 5-10 WBCs
7.	Previous local treatment guidelines without bacteria: at least moderate LE or at least 10-25 WBCs or positive nitrites
8.	Current local treatment guidelines without bacteria: positive nitrites or (at least moderate LE and at least 10-25 WBCs)
9.	Previous local treatment guidelines with bacteria: at least moderate LE or at least 10-25 WBCs or positive nitrites or any bacteria
10.	Current local treatment guidelines with bacteria: positive nitrites or any bacteria or (at least moderate LE and at least 10-25 WBCs).
11.	Previous local treatment guidelines with hematuria: at least moderate LE or at least 10-25 WBCs or positive nitrites or any blood
12.	Current local treatment guidelines with hematuria: positive nitrites or any blood or (at least moderate LE and at least 10-25 WBCs)

AAP: American Academy of Pediatrics; LE: leukocyte esterase; UTI: urinary tract infection; WBCs: white blood cells

cimens, the presence of at least moderate LE was the best predictor.

Conclusion: Using a machine learning approach, criteria for a positive UA were developed for the pediatric UC setting.

Introduction

Urinary tract infections (UTIs) are common across pediatric populations. While pediatric UC specific data is lacking, the overall incidence of UTIs is 1.5% in children under 2 years old¹ and 6% in females under 6 years old.²

Urinalysis (UA), among the first laboratory tests used in medicine, remains a widely available, low cost clinical lab test with broad applicability.³ UA may consist of chemical examination (eg, colorimetric dipstick) and/or microscopic evaluation.⁴ Among the data provided by UA, surrogate markers of infection are evaluated to determine if antibiotics are indicated while awaiting urine culture results.⁴ However, the exact definition of what constitutes a “positive” UA varies across studies. The American Academy of Pediatrics (AAP) guidelines defined a positive UA for children between 2-24 months of age as a chemical dipstick test that is positive for either nitrites or leukocyte esterase (LE) or a microscopic analysis positive for either leukocytes or bacteria.⁵ However, these AAP guidelines do not define threshold values for positive leukocytes, LE, or bacteria. For older

“Adding greater clarity on appropriate threshold values for UAs would allow for more standardized practice in the diagnosis of UTI in children.”

children, what constitutes a positive UA is even less well defined. European guidelines published in 2015⁶ and updated in 2021⁷ also fail to give a specific definition for a positive UA. The 2021 guideline update, however, does define a negative UA as showing negative results for nitrites and LE on dipstick testing and no pyuria or bacteriuria on microscopic exam.

Given the lack of consensus definition for positive results, studies on pediatric UTI have used various thresholds for defining positive results. A UA with a positive nitrite test is always considered positive.^{5,6,7,8,9,10,11,12,13} Positive LE values used range from “present”^{8,9,10,11} to greater than “trace.”^{12,13} The presence of bacteria is sometimes included in the definition of a positive UA,⁹ but not always.^{8,10,11,12,13} Positive white blood cell (WBC) values range from at least 5 WBCs per high powered field (HPF)^{10,13} to >10 WBC/HPF.⁹

This disparity between cutoffs used by various researchers has led to heterogeneity in how individual

Table 2. Predictor Combinations	
Model	Predictors
1.	LE+ nitrites+ WBCs+ blood+ bacteria
2.	LE + Nitrites + WBCs ₅ + Blood + Bacteria
3.	LE + Nitrites + WBCs ₁₀ + Blood + Bacteria
4.	LE moderate + Nitrites + WBCs + Blood + Bacteria
5.	LE moderate + Nitrites + WBCs ₅ + Blood + Bacteria
6.	LE moderate + Nitrites + WBCs ₁₀ + Blood + Bacteria
<i>LE: leukocyte esterase (yes/no); Blood: negative vs positive; LE Moderate: moderate to large LE vs none or trace or small; Nitrites: negative vs positive; WBCs: white blood cells (yes/no); Bacteria: negative vs positive; WBCs₅: WBCs negative or less than 5 vs. 5 or more; WBCs₁₀: WBCs negative or less than 10 vs. 10 or more</i>	

institutions and clinicians interpret pediatric UA results. Especially in UC settings, UAs are used as the initial diagnostic study to determine if empiric antibiotics or a urine culture are indicated.^{5,7} Adding greater clarity on appropriate threshold values for UAs would allow for more standardized practice in the diagnosis of UTI in children. Such standardization of thresholds could also improve antibiotic stewardship, as many children are treated empirically based on variable UA findings while the urine culture is pending.^{5,7}

While there have been multiple studies evaluating appropriate diagnostic cutoffs to define a positive urine culture,^{14,15,16} there has never been a study evaluating the appropriate cutoffs of WBCs, red blood cells (RBCs), LE, or nitrites on urine dipstick testing to warrant a positive UA in the pediatric UC setting.

In 2020, our system of pediatric UC centers undertook a large quality improvement (QI) project to improve the management of children with suspected UTI. The overview of this project has already been described in *JUCM*.¹⁷ As part of this QI project, we reviewed 6,327 patient encounters that had corresponding UA values for these patients collected during the same visit.

We identified a lack of clarity on the operational definition of a “positive” UA in reviewing the results of this project. At the start of the project, we defined a UA as “positive” when either nitrites or at least moderate LE were present on dipstick testing, or at least 10 WBC/HPF or bacteria were present on the microscopic analysis. These definitions were informed by existing literature on the topic, but were somewhat arbitrary given the lack of a consensus definition of test positivity. To answer this question, the previously collected data was analyzed using a machine learning approach.

Machine learning, a branch of artificial intelligence, is dedicated to the creation of algorithms that enable

computers to learn from data and make predictions or decisions. This technology is employed in a wide range of applications, including image and speech recognition, recommendation systems, decision trees, and predictive analytics.

Methods

This project was reviewed by the Eastern Virginia Medical School Institutional Review Board, which found that it met criteria for QI and was therefore granted “not human subjects research” status. Only deidentified data were analyzed as part of this project.

Urine samples were collected from 4 pediatric UC centers that were part of a single health system in Southeast Virginia between April 2018 and April 2020. Urinalyses and cultures were ordered at the discretion of the clinician. All patients with both a UA and urine culture from the same visit during the project period were included.

“We identified a lack of clarity on the operational definition of a ‘positive’ UA in reviewing the results of this project.”

For urine samples from all reviewed charts LE, WBCs, nitrite, blood, and bacteria were analyzed as predictors for a positive urine culture. Clean catch and catheterized specimens were analyzed separately. For clean catch samples, cutoffs of both 50,000 and 10,000 colony forming units (CFUs) of a single or predominate organism were used as the definition of a positive urine culture. For catheterized samples, cutoffs of 10,000 and 50,000 CFUs were used.

For all samples, dipstick results were obtained using a CLINITEK Status+ Analyzer and Siemens Multistix 10 SG reagent sticks. Microscopic results were obtained from our affiliated clinical laboratory.

Prior to running classification models, univariate associations between each predictor and CFU cutoff were performed. Multivariate logistic regression was used to determine the UA findings that predict positive urine cultures. Twelve possible models for a positive UA were used as the basis of the analysis (Table 1). Some of these possible criteria were based on national guidelines. Because this was a QI project, other possible criteria were based on local treatment guidelines. The multicollinearity between predictors was evaluated using the vari-

Table 3. P-value and AUC Results from Logistic Regression Analysis for All Models											
Model	1&2	3	4	5	6	7	8	9	10	11	12
Clean catch, CFUs 50,000											
LE	<0.001	<0.001	-	<0.001	-	-	-	-	-	-	-
LE Moderate	-	-	<0.001	-	<0.001	<0.001	-	<0.001	-	<0.001	-
Blood	<0.001	-	-	-	-	-	-	-	-	<0.001	<0.001
WBCs	0.50	-	-	-	-	-	-	-	-	-	-
WBCs ₅	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
WBCs ₁₀	-	-	-	-	-	<0.001	-	<0.001	-	<0.001	-
Nitrites	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bacteria	<0.001	<0.001	<0.001	-	-	-	-	<0.001	0.001	-	-
LE&WBCs	-	-	-	-	-	-	<0.001	-	<0.001	-	<0.001
AUC	0.8242	0.8430	0.8527	0.8349	0.8461	0.8365	0.7810	0.8482	0.8088	0.8454	0.7963
Clean catch, CFUs 100,000											
LE	<0.001	<0.001	-	<0.001	-	-	-	-	-	-	-
LE Moderate	-	-	<0.001	-	<0.001	<0.001	-	<0.001	-	<0.001	-
Blood	<0.001	-	-	-	-	-	-	-	-	<0.001	0.91
WBCs	0.50	-	-	-	-	-	-	-	-	-	-
WBCs ₅	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
WBCs ₁₀	-	-	-	-	-	<0.001	-	<0.001	-	<0.001	-
Nitrites	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bacteria	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	-	-
LE&WBCs	-	-	-	-	-	-	<0.001	-	<0.001	-	<0.001
AUC	0.8376	0.8513	0.8605	0.8442	0.8539	0.8457	0.7993	0.8571	0.8215	0.8562	0.8143

ance inflation factor (VIF). The boosted C5.0 algorithm using the resampling method was the particular machine learning approach used in this case and was used to create decision trees. Boosted C5.0 is a well-known and widely used machine learning model that combines multiple classifiers to enhance predictive accuracy. Boosting improves model accuracy by leveraging misclassifications from the initial C5.0 decision tree models and adjusting to complex data relationships. In comparison to other decision tree models like C4.5 and CART, boosted C5.0 achieves superior accuracy with lower error rates and faster processing.

Six combinations of predictors were then developed to create decision trees (Table 2). The performance of classification results was evaluated by sensitivity, specificity, accuracy, negative predictive value, F-measure, and area under curve (AUC).

The univariate associations between continuous variables and each respective CFU group were assessed using a t-test or Mann-Whitney test, while the correlations between categorical variables and each CFU group were assessed using chi-square or Fisher’s exact test. All statistical tests were performed using R Studio 4.1.0. All statistical tests were 2-sided, and p<0.05 was considered as statistically significant.

Results

A total of 5,075 clean catch specimens and 1,252 catheterized specimens were reviewed. During that time period, 158,981 patients were seen between all UC centers. Patients ranged in age from 14 days to 20 years. Eighteen percent of patients that were included in this data set had a history of a previous UTI, and most patients seen at our UC centers are healthy without a history of any

Model	1&2	3	4	5	6	7	8	9	10	11	12
Catheterized CFUs 10,000											
LE	<0.001	<0.001	-	<0.001	-	-	-	-	-	-	-
LE Moderate	-	-	<0.001	-	<0.001	<0.001	-	<0.001	-	<0.001	-
Blood	0.44	-	-	-	-	-	-	-	-	0.25	0.50
WBCs	0.94	-	-	-	-	-	-	-	-	-	-
WBCs ₅	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
WBCs ₁₀	-	-	-	-	-	<0.001	-	<0.001	-	<0.001	-
Nitrites	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bacteria	0.008	0.40	0.59	-	-	-	-	0.07	0.001	-	-
LE&WBCs	-	-	-	-	-	-	<0.001	-	<0.001	-	<0.001
AUC	0.9223	0.9339	0.8980	0.9349	0.8961	0.8725	0.7865	0.8857	0.8297	0.8775	0.7974
Catheterized CFUs 50,000											
LE	<0.001	<0.001	-	<0.001	-	-	-	-	-	-	-
LE Moderate	-	-	<0.001	-	<0.001	<0.001	-	<0.001	-	<0.001	-
Blood	0.24	-	-	-	-	-	-	-	-	0.62	0.91
WBCs	0.78	-	-	-	-	-	-	-	-	-	-
WBCs ₅	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-
WBCs ₁₀	-	-	-	-	-	<0.001	-	<0.001	-	<0.001	-
Nitrites	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bacteria	0.01	0.30	0.45	-	-	-	-	0.08	0.002	-	-
LE&WBCs	-	-	-	-	-	-	<0.001	-	<0.001	-	<0.001
AUC	0.9237	0.9333	0.9037	0.9312	0.8991	0.8811	0.7992	0.8938	0.8380	0.8846	0.8078
<i>AUC: area under the curve; CFU: colony forming units; LE: leukocyte esterase (yes/no); LE Moderate: moderate to large LE vs none or trace or small; WBCs: white blood cells (yes/no); WBCs₅: WBCs negative or less than 5 vs. 5 or more; WBCs₁₀: WBCs negative or less than 10 vs. 10 or more; Blood: negative vs positive; Nitrites: negative vs positive; Bacteria: negative vs positive; LE&WBCs: at least moderate LE and WBCs 10 or more</i>											

type of urinary tract disease or anatomical abnormalities. For catheterized specimens, 74% of patients had a fever and 72% were under 2 years old. For clean catch specimens, 35% of patients had abdominal pain, 64% had urinary symptoms, and 22% had fever.

The results of the univariate model for catheterized specimens revealed significant correlation (P<0.001) between all possible predictors of a UTI, except for presence of RBCs, and a positive urine culture when using either 10,000 or 50,000 CFUs as the definition of a positive culture. The results of the univariate model for clean catch specimens revealed significant correlation (P<0.001) between all possible predictors of a UTI and a positive urine culture when using either 50,000 or 100,000 CFUs as the definition of a positive culture.

Table 3 presents the results of the logistic regression for each model for clean catch and catheterized spe-

cimens. The VIF criteria did not suggest any multicollinearity between independent variables in any model. For clean catch specimens, model 4, followed by model 9 had the highest AUC, suggesting that moderate LE, nitrites, WBCs ≥5 or >10 and bacteria (all p<0.001) would be the strongest predictors of a positive urine culture. For catheterized specimens, model 3 and model 5 had the highest AUC, followed by models 1&2 and model 4, suggesting that LE, nitrites, and WBCs ≥5 (all p<0.001) would be the best factors for predicting a positive urine culture.

After logistic regression was performed, decision trees were developed using the previously described predictor combinations. The method for developing decision trees assessed the best combination of variables in each model and suggested the combination with the highest impact on the outcome. For models 4-6 WBCs, blood, and bacteria were not suggested as part of the best combination

Table 4. Decision Tree Models, Excluding Those With Positive Nitrites

	Predictor	Accuracy	Error	Sensitivity	Specificity	F-measure	AUC
Model 1	LE & Bacteria	0.7168	0.2832	0.2518	0.7016	0.1940	0.7732
Model 2	LE & WBCs ₅	0.7814	0.2186	0.3006	0.7795	0.2183	0.7884
Model 3	LE & WBCs ₁₀	0.8473	0.1527	0.3744	0.8705	0.2379	0.7613
Model 4-6	LE moderate	0.8714	0.1286	0.3992	0.9253	0.2041	0.6714
	Predictor	Accuracy	Error	Sensitivity	Specificity	F-measure	AUC
Model 1	LE & Bacteria & Blood	0.7647	0.2352	0.2345	0.7615	0.1814	0.7810
Model 2	LE & WBCs ₅	0.7723	0.2277	0.2444	0.7677	0.1884	0.7955
Model 3	LE & WBCs ₁₀	0.8454	0.1546	0.3082	0.8603	0.2123	0.7711
Model 4-6	LE moderate	0.8775	0.1225	0.3251	0.9182	0.1855	0.6720
	Predictor	Accuracy	Error	Sensitivity	Specificity	F-measure	AUC
Model 1	LE	0.9241	0.0759	0.6424	0.9388	0.3594	0.8771
Model 2	LE & WBCs ₅	0.9342	0.0658	0.7520	0.9703	0.3534	0.8185
Model 3	LE & WBCs ₁₀	0.9325	0.0674	0.8506	0.9876	0.3246	0.7562
Model 4-6	LE moderate	0.9309	0.0691	0.8933	0.9923	0.3102	0.7338
	Predictor	Accuracy	Error	Sensitivity	Specificity	F-measure	AUC
Model 1	LE	0.9182	0.0818	0.5698	0.9276	0.3389	0.8818
Model 2	LE & WBCs ₅	0.9334	0.0667	0.6720	0.9615	0.3401	0.8250
Model 3	LE & WBCs ₁₀	0.9351	0.0649	0.7586	0.9803	0.3158	0.7606
Model 4-6	LE moderate	0.9401	0.0599	0.8400	0.9887	0.3198	0.7526

AUC: area under the curve; CFU: colony forming units; LE: leukocyte esterase (yes/no); LE Moderate: moderate to large LE vs none or trace or small; WBCs: white blood cells (yes/no); WBCs₅: WBCs negative or less than 5 vs. 5 or more; WBCs₁₀: WBCs negative or less than 10 vs. 10 or more; Blood: negative vs positive; Nitrites: negative vs positive; Bacteria: negative vs positive; LE&WBCs: at least moderate LE and WBCs 10 or more

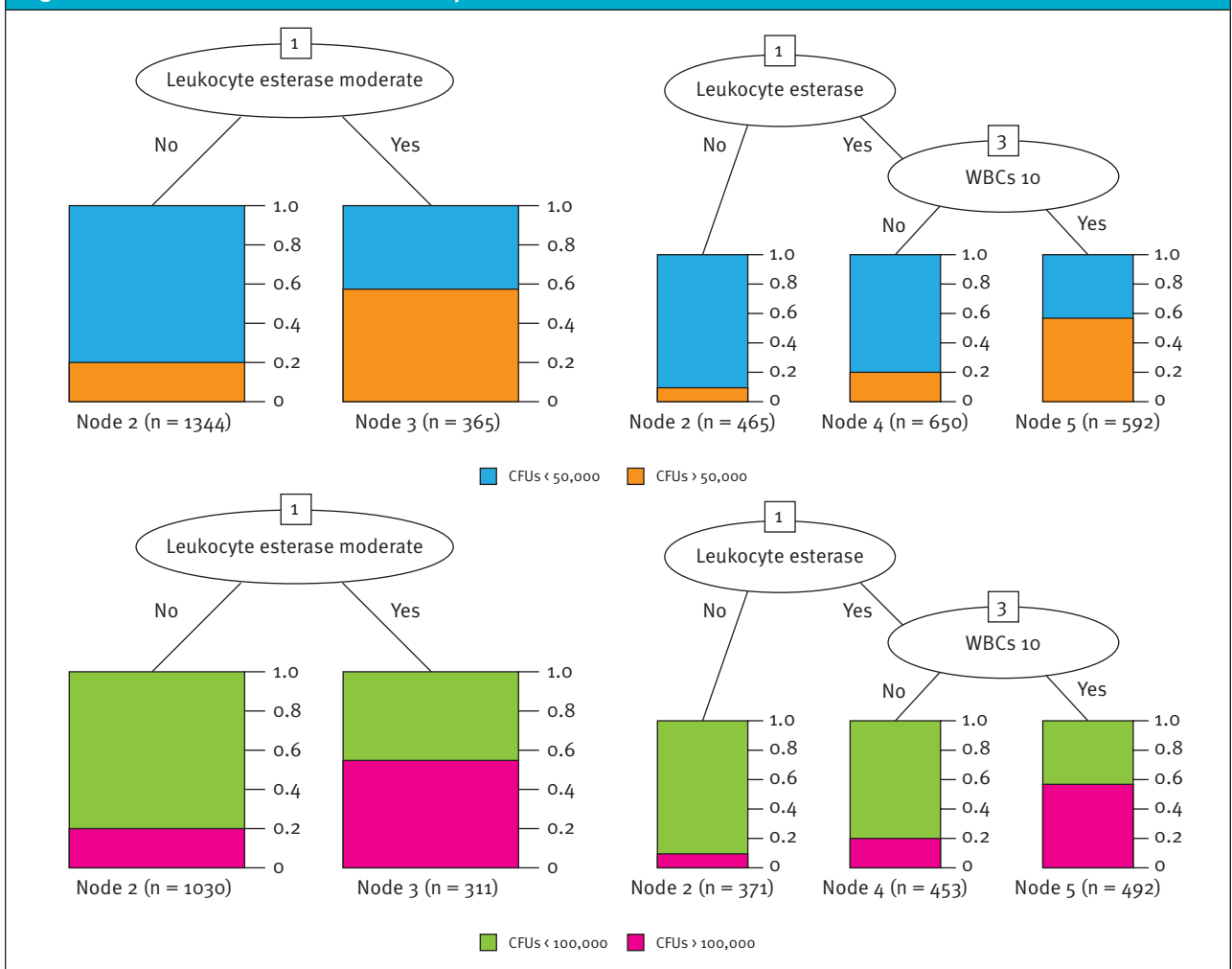
by this method. The best combination for these models was at least moderate LE and positive nitrites. When the non-ideal variables were dropped, these 3 models were identical and were therefore combined. For both clean catch and catheterized specimens, all of the best decision trees included a positive nitrite component.

Because it is already known that a positive nitrite value on UA is strongly correlated with a positive urine culture, a separate analysis of nitrite negative specimens was performed (Table 4). For nitrite negative catheterized specimens, LE present, and WBCs greater than or equal to 5 had the best accuracy and F-measure for both CFU cutoffs. This was followed by LE greater than or equal to moderate. For clean catch specimens, LE greater than or equal to moderate had the best accuracy and F-measure for both CFU cutoffs. This was followed by WBCs ≥10 and LE present. Figures 1 and 2 show the decision trees for the best predictive models for nitrite negative clean catch and catheterized samples.

Discussion

These results indicate that the best predictive models for a positive UA include positive nitrites and specific LE and WBC cutoffs. The most predictive UA cutoffs differed based off collection method, which is consistent with existing knowledge about the significance of varying amounts of WBCs and bacteria in catheterized versus bag collection. To our knowledge, this is the first study to evaluate specific thresholds for a positive UA using a machine learning approach. Commonly used cutoffs cited in other studies include >5 WBCs/HPF or presence of any LE or nitrites, but these had not been statistically evaluated for appropriateness and are often used universally regardless of collection method.^{5,7,8,18,19}

The presence of nitrites, which current guidelines deem to indicate a “positive” UA⁷⁻¹³ was corroborated as a strong predictor of a positive urine culture (p <0.001). Excluding positive nitrites, moderate LE was found to have a high predictivity for both catheterized and clean catch samples (accuracy = 0.9401 and 0.8775,

Figure 1. Decision Trees For Clean Catch Specimens

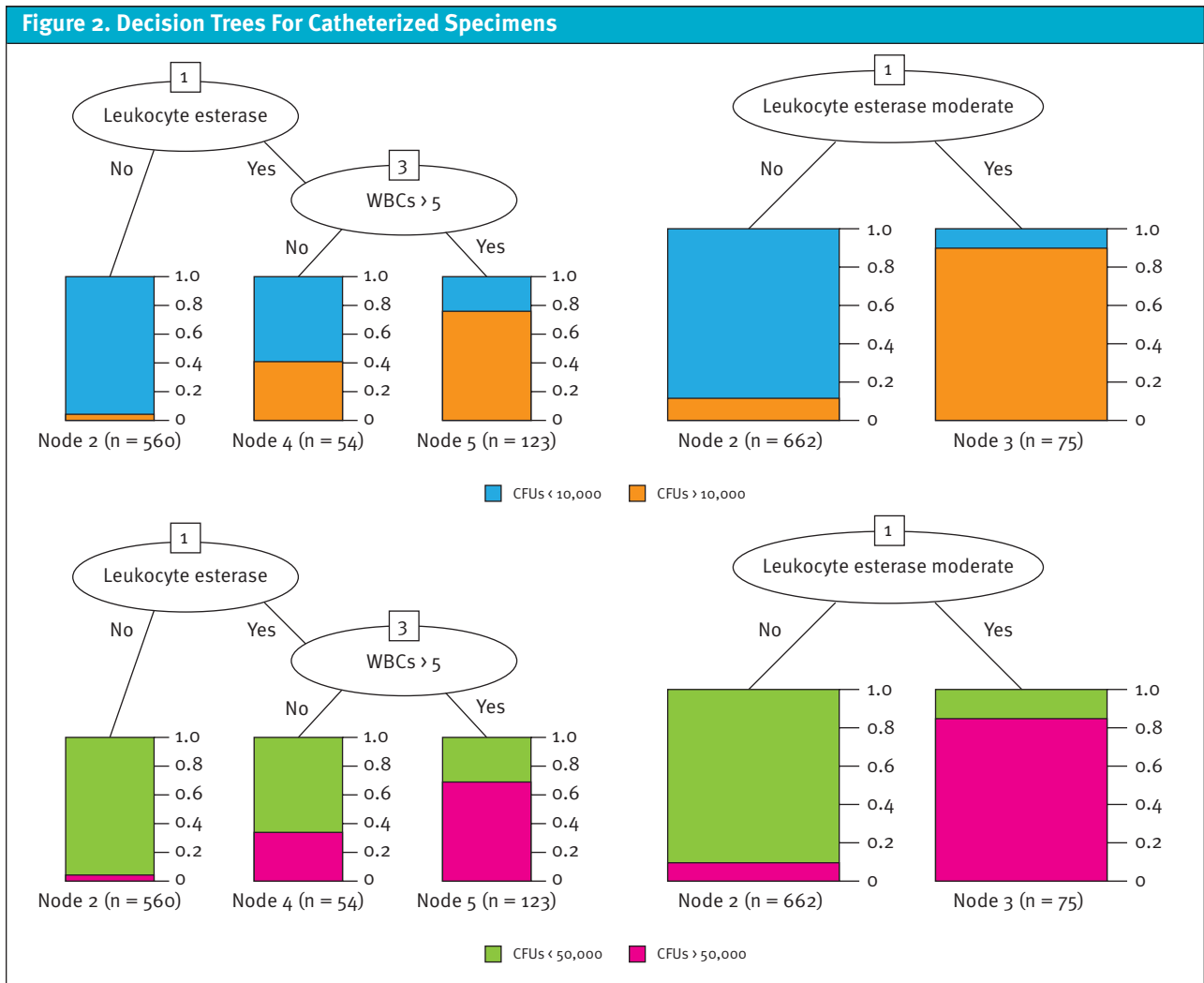
respectively). Presence of LE and WBCs >5 was also predictive of a positive urine culture in catheterized samples (accuracy = 0.9342, F-measure = 0.3534), while presence of LE and WBCs >10 was also predictive of positive urine culture in catheterized samples (accuracy = 0.8454, F-measure = 0.2123). All of our predictors were noted to have a higher accuracy in catheterized samples versus clean catch samples (Table 4).

Limitations

This project had several limitations. We used a specific colorimetric urine dipstick. Other dipsticks may have different semi-qualitative (eg, trace, moderate, etc.) results for corresponding quantities of LE, blood, protein etc. Likewise, the number of WBC, RBC, and bacteria in a given sample is somewhat subjectively determined by a laboratory technician. We examined only catheterized

and clean catch samples and did not evaluate cutoffs for suprapubic aspiration or sterile urine bags. However, using similar methodology, this could be evaluated in a future study. This was an observational study, and urine samples and cultures were at the discretion of the treating clinician and disassociated from the patients. This limits assessment of patient factors that may influence these thresholds.

It is unclear how encounters and patients with complete UA and culture data may be different from those in which one or both of these studies were not performed. These analyses were part of a local quality improvement project at a single system of pediatric UC centers, and generalizability could be verified if the results were to be replicated in other geographies and care settings. Additionally, some UC centers do not have access to rapid urine microscopy results and/or



materials or staff required to obtain catheterized urine specimens in children.

While this study was limited to a single group of UC centers, it did contain a large number of mostly healthy patients. Most catheterized specimens were obtained in children under the age of 2 years presenting with fever, while clean catch samples were commonly obtained from patients presenting with fever, urinary symptoms, or abdominal pain. Our results would therefore most likely be applicable to other pediatric UC centers that see primarily healthy children with common complaints that could be concerning for a UTI.

Future studies should investigate the clinical application of thresholds prospectively to evaluate their effects on treatment decisions and patient outcomes. We do not suggest that these criteria for positivity of UA be adopted without further research in guiding decisions

around urine culture or empiric treatment. Urine cultures provide critical information to help guide UTI treatment and assure antibiotic stewardship through pathogen identification and susceptibility analysis.^{5,7} These new criteria could, however, improve urine culture stewardship and, by extension, antibiotic stewardship. This could decrease cost by eliminating unnecessary urine cultures and antibiotic courses in the event of a negative UA, as well as reduce the negative effects of unnecessary antibiotic use such as the colonization of resistant bacteria, *Clostridium difficile* infection, and potential drug adverse effects.^{20,21}

Finally, it is noteworthy that urine concentration (ie, specific gravity) has been shown to affect thresholds of pyuria which predict a positive urine culture in pediatric emergency department patients.²² Specific gravity (SG) was not included in our regression model and therefore

future studies could clarify appropriate cut-off values for pediatric UAs for various ranges of SG.

Conclusion

The secondary analysis of data from our QI project using machine learning to evaluate pediatric urinalyses indicated that specific value cutoffs for LE, nitrites, bacteria, and RBC could predict the likelihood of a positive urine culture in clean catch and catheterized samples. More data is needed to determine if this holds true for different collection methods. ■

Manuscript submitted May 17, 2024, accepted September 23, 2024.

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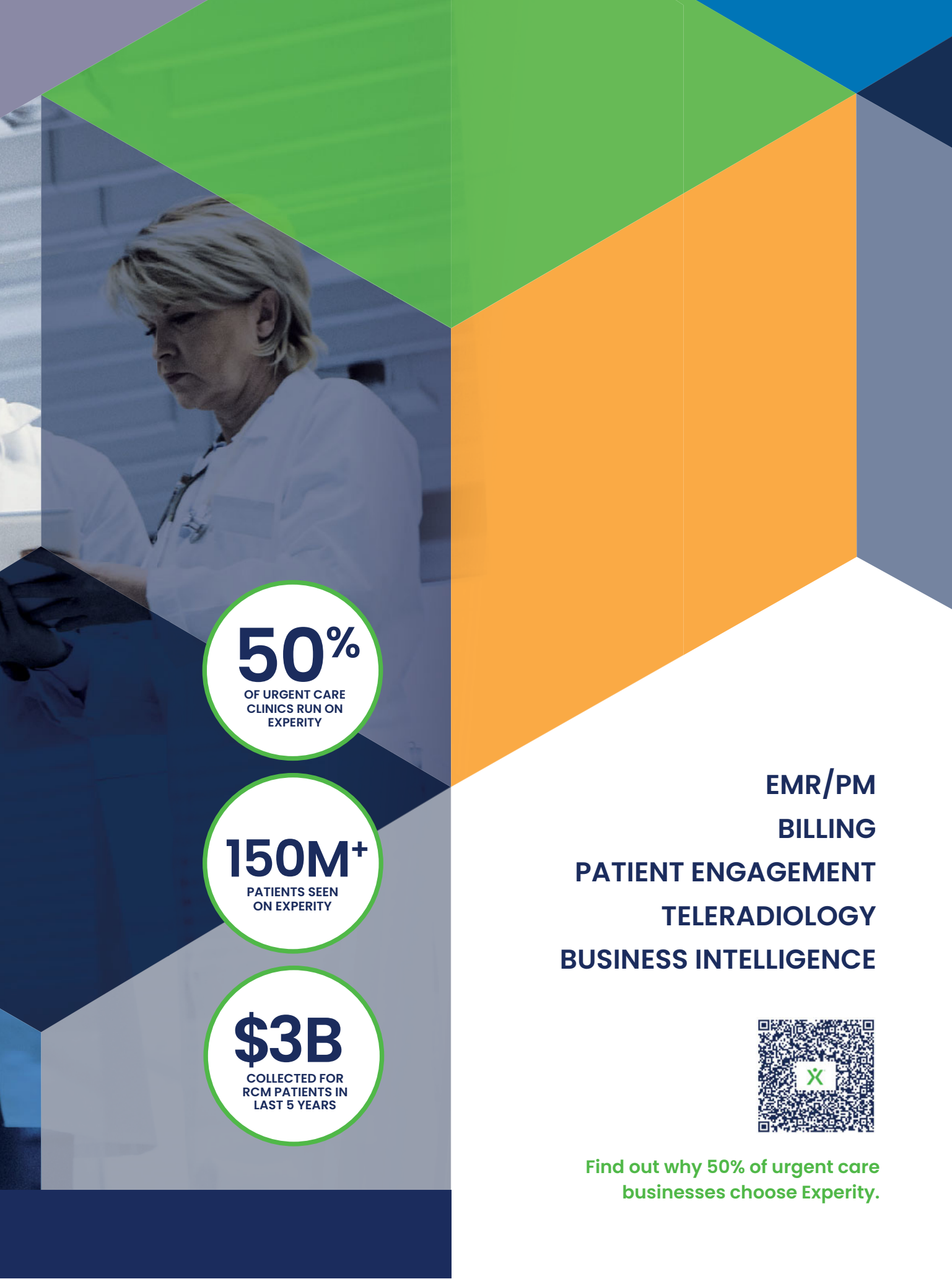
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Sophistication of ECG for Detection of Acute Coronary Syndromes

Take Home Point: Cardiac electrical biomarker (CEB), a finding detectable on ECG, may hold potential for identifying patients with acute myocardial ischemia; this may have significant implications for urgent care (UC) based chest pain risk stratification.

Citation: Chattopadhyay S, Adjei F, Kardos A. Changes in Cardiac Electrical Biomarker in Response to Coronary Arterial Occlusion: An Experimental Observation. *J Cardiovasc Transl Res.* 2024 Aug;17(4):870-878. doi: 10.1007/s12265-024-10487-w.

Relevance: Evaluation of chest pain is particularly challenging in UC where immediately available troponin blood testing is rarely available. Prior studies have shown that CEB has utility in identification of patients with non-ST elevation myocardial infarction (NSTEMI). CEB relates to alterations in polarization cardiac myocytes in the setting of ischemia which can be detected on ECG.

Study Summary: This was a clinical trial designed to evaluate the role of CEB in assessment of suspected myocardial ischemia and included consecutive adults undergoing elective angiography for chronic stable angina. CEB was acquired using the Vectraplex ECG System (VectraCor, Inc., Totowa, New Jersey), which derives a 12-lead ECG (dECG). Control patients were individuals without any modifiable risk factors for coronary artery disease (CAD), previous history of ischemic heart disease (IHD), or ECG or hematological or biochemical abnormalities, and with normal vitals (CEBc). Subjects in the experimental group had CEB recorded during acute ischemia induced by balloon occlusion of coronary arteries during angiography.

The authors recruited 100 patients into the study (75 required stenting, 25 no stenting) who were compared to 49 controls. They found evidence that reduction in coronary blood flow, without resultant myonecrosis induced either

by transient arterial occlusion or adenosine stress, increased CEB. CEB retained “memory” of the ischemic episode and remained elevated for about 3.5 hours. Baseline CEB in patients with asymptomatic obstructed CAD was higher than controls but not in patients with non-obstructive CAD.

“Evaluation of chest pain is particularly challenging in UC where immediately available troponin blood testing is rarely available.”

Editor’s Comments: This study was limited to findings using a specific device (Vectraplex ECG system). However, the results of this study support findings of prior studies showing potential for CEB as an additional ECG feature suggestive of ischemia. Given the ubiquity of troponin testing in emergency departments (EDs), the potential value of such a biomarker would be most noteworthy in outpatient settings, such as UC, where serum biomarkers cannot be routinely assessed. ■

Confirming Elevated Suicide Risk Among Physicians

Take Home Point: Suicide risk, particularly among female physicians, was found to be elevated compared to the general population in this large meta-analysis.

Citation: Zimmermann C, Strohmaier S, Herkner H, et. al. Suicide rates among physicians compared with the general population in studies from 20 countries: gender stratified systematic review and meta-analysis. *BMJ.* 2024;386:e078964

Relevance: The work of clinicians is particularly demanding and various real and perceived barriers exist for clinicians to seek mental health care. Prior studies have generally shown increased risk of suicide among doctors. This study aimed at verifying these findings.



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Study Summary: This meta-analysis was conducted based on recommendations of the Cochrane Collaboration and reported in accordance with the preferred reporting items for systematic review and meta-analyses (PRISMA) statement. Observational studies with data on suicide rates among physicians compared with the general population were reviewed on Medline, PsycINFO, and Embase. Other databases reviewed included the U.S. National Institute for Occupational Safety and Health, the UK Office for National Statistics, Switzerland’s Federal Statistical Office, and Statistics Denmark.

The authors used 42 datasets for male physicians and 27 datasets for female physicians. They found the suicide rate ratio for female physicians to be significantly higher than non-physician women (1.76, 95% confidence interval [CI] 1.40-2.21), however, not for male physicians (1.05, 95% CI 0.90-1.22). There was a high level of heterogeneity in results from different studies suggesting that suicide risk for male and female physicians was not consistent across various physician populations. Additionally, this suicide risk for physicians seems to have declined in recent years, with lower risk of suicide among male and female doctors in the 10 most recent data sets compared to the 32 older data sets.

Editor’s Comments: The authors acknowledged prior evidence points to the possibility that suicides in physicians may be underreported compared to the general population. Since the COVID-19 pandemic, increasing numbers of doctors have left clinical practice, which may have implications on suicide rates. While reassuring that suicide rates among physicians seem to be declining, this meta-analysis still suggests that rates remain elevated among female physicians in particular. It remains imperative for healthcare organizations to foster work environments that allow doctors and other providers to feel safe seeking mental health support. Clinicians should also be sensitive to warning signs of poor mental health among their colleagues and proactive about expressing concerns. ■

Changes in ‘Safety Netting’ Advice Documentation

Take Home Point: In this United Kingdom (UK) study, the frequency of safety netting advice (SNA) (ie, counseling about return precautions) documented in after-hours primary care increased over time.

Citation: Edwards P, Finnikin S, Wilson F, et. al. Safety-netting advice documentation out-of-hours: a retrospective

cohort from 2013 to 2020. *BJGP*. 2024.0057. DOI: <https://doi.org/10.3399/BJGP.2024.0057>

“Clinicians should also be sensitive to warning signs of poor mental health among their colleagues.”

Relevance: SNA is a patient safety and risk management technique used within a healthcare encounter meant to advise patients of diagnostic uncertainty and in what circumstances and where to seek further medical attention for changes in their condition.

Study Summary: This was a retrospective cohort review of the electronic health record (EHR) using the Birmingham Out of hours general practice Research Database (BORD), UK. Stratified samples of 30 consultations per month (ie, 10 home visits, 10 telephone consultations, and 10 clinic encounters) occurring from 2013-2020 were reviewed. Two researchers independently screened consultations for the presence of SNA and follow-up with agreement scores of 98% (Cohen’s kappa (κ)=0.93) and 91% (κ =0.82), respectively.

The authors reviewed 1,886 consultations/visits with 1,862 unique patients. They found overall frequency of documentation of SNA was 78.0% (1,472/1,886) with the frequency increasing from 75% in 2014 to 81% in 2020. Respiratory presentations had the highest frequency of SNA documentation (85.6%), and behavioral health cases had the lowest (51.9%). SNA more commonly was in the form of generic advice (52.7%) (eg, “call back if worsens”), rather than specific advice (47.3%) (eg, “if no better in 2 days, then see your own doctor”). There was no significant difference between the frequency of SNA documented for patients seen by nurses (87.9%) compared to doctors (84.4%).

Editor’s Comments: This study was limited to the Birmingham, UK metro area potentially limiting its generalizability. Additionally, SNA might be expected to be affected by many factors including clinicians’ perceptions of liability and healthcare accessibility—two factors that differ significantly between the U.S. and UK. Perhaps the most interesting finding is that SNA documentation is common, and increasingly so, in a single payer healthcare system where clinicians tend to have relatively lower risk of malpractice liability. ■

Assessing Trustworthiness of Medical Content in the Era of Artificial Intelligence

Take Home Point: In the advent of artificial intelligence (AI), the veracity of audio and video content is increasingly difficult to verify. This article reviews cautionary tales of “deep fakes” (ie, AI creation of fake content intended to be indistinguishable from actual recordings) that fooled patients in the UK.

Citation: Stokel-Walker C. Deepfakes and doctors: How people are being fooled by social media scams. *BMJ*. 2024 Jul 17;386: q1319. doi: 10.1136/bmj. q1319.

Relevance: Medical influencers on social media are increasingly seen as sources of credible information by the public. False likenesses created by generative AI (ie, deep fakes) are likely to become more common. As legislation regulating this practice is limited, being able to distinguish deep fakes and how to respond when encountered is an area of uncertainty for most clinicians and laypersons.

Study Summary: This was a commentary published in the *British Medical Journal* discussing the increasing incidence of medical deep fake content on social media platforms and the potential impact on patient behaviors. The author summarizes the story of a well-known physician personality who was emulated in a deep fake to promote a non-evidence based “cure” for hypertension. A recent study of deep fakes, specifically examining scientific subjects, suggested that 25-50% of people cannot distinguish them from authentic videos.

Identifying deep fakes is increasingly a challenge, however, the author cites several examples of how consumers can be alerted to the questionable authenticity of content. For example, viewers may notice anatomically incorrect hands or awkward movement patterns. While propagation of content on social media mimicking celebrities, including clinicians, is a likely inevitability of increasingly powerful AI, heightened consumer vigilance can mitigate the effects of this trend.

The author suggests the following verification strategies:

- Look carefully at the video or image for non-human features
- Contact the person endorsing the product to ascertain its legitimacy
- Leave comments on the content questioning its veracity

- Use the platform’s built-in reporting tools if available

Editor’s Comments: This was an opinion piece and not research. Further studies on the incidence of deep fakes and the outcomes will be important for informing legislation restricting the practice. ■

Fighting Disparities in Cardiovascular Disease Management Among Women

Take Home Point: Women suffer significant morbidity and mortality related to cardiovascular disease (CVD). Considerations of “classic” CVD risk factors and presentations may bias clinicians toward missed or delayed diagnosis of cardiovascular events in women.

Citation: Tayal U, Pompei G, Wilkinson I, et. al. Advancing the access to cardiovascular diagnosis and treatment among women with cardiovascular disease: a joint British Cardiovascular Societies’ consensus document. *Heart*. 2024 Sep 24; heartjnl-2024-324625. doi: 10.1136/heartjnl-2024-324625.

Relevance: Despite progress in pharmacotherapy to mitigate the morbidity associated with CVD, it remains the leading cause of death in men and women. The strategies that have been successful in men have not proven equally effective in women suggesting the need for more gender specific guidance to mitigate gender disparities and inequities in outcomes.

Study Summary: This was a consensus document created by CVD experts from the UK outlining important, sex-specific differences in CVD presentations between genders. The group used existing evidence to offer evidence informed recommendations for addressing inequities as it pertains to cardiovascular health among women. The authors used the World Health Organization (WHO) gender definitions, which relies upon the sex assigned at birth as the influences of hormones play an important role in determining the timing and patterns of CVD and atherosclerosis.

Additionally, with the changes in the hormonal milieu of postmenopausal women, there is increased incidence of coronary vasomotor disorders thought to be related to higher levels of systemic inflammation. For example, the authors note that lower estrogen levels increase the susceptibility to Takotsubo (stress) cardiomyopathy in women, with 90% of cases occurring in women and 80% of these cases being in women over age 50. Further support for

the influence of hormones on CVD risk, early and late menarche are both associated with an increased long-term risk of cardiovascular events. Women presenting with obstructive CAD tend to be older than their male counterparts and have more comorbidities. The authors also outline the important implications of women having more microvascular coronary disease than men and how this can lead to relatively high rates of false negative coronary angiography. Additionally, the presence of breast tissue and differences in electrical signaling in the heart can influence the test characteristics of electrocardiograph and nuclear medicine stress testing.

Editor’s Comments: This consensus article covers coronary disease, valvular disorders, and dysrhythmias among other categories of CVD as well as the gender differences in work-up and treatment strategies. It would be impossible to summarize all their findings and recommendations based on a review of the existing literature. However, it is an important document for acute care providers to become familiar with given the frequency with which women present with chest pain or other potentially cardiac symptoms in UC. The authors do a formidable job of collating and presenting the evidence supporting the importance of gender specific approaches to patients with potential CVD.

Predicting Concussion Recovery in Children

Take Home Point: Prognostic prediction models (PPM) were found to slightly outperform clinicians’ abilities to predict recovery after concussion for children with minor head injuries (mTBI).

Citation: Wyrwa J, Hoffberg A, Stearns-Yoder K, et al. Predicting Recovery After Concussion in Pediatric Patients: A Meta-Analysis. *Pediatrics*. 2024;154(3): e2023065431

Relevance: Concussion is among the most common pediatric injuries. Among the most pressing questions on patients and parents’ minds at the time of concussion is how long their symptoms will last. Many prediction models have been put forth attempting to predict which patients are likely to have prolonged post-concussion syndrome (PPCS).

Study Summary: This was a systematic review to examine all peer-reviewed PPMs estimating the risk of delayed recovery in pediatric patients after sustaining a concussion. The authors followed the recommendations of the Co-

chrane Prognosis Methods Group. Literature searches of Ovid Medline, Embase, Ovid PsycInfo, Web of Science Core Collection, Cumulative Index to Nursing and Allied Health Literature, Cochrane Library, and Google Scholar were run. Modification of the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach for prognostic factor studies was used to assess quality of evidence.

“Among the most pressing questions on patients’ and parents’ minds at the time of concussion is how long their symptoms will last.”

The authors screened over 17,000 studies and identified 78 that were reviewed; ultimately 6 studies were included in their review. Thirteen PPMs were examined including the Predicting and Preventing Post concussive Problems in Pediatrics (5P) clinical risk, the Buffalo Concussion Physical Examination risk for delayed recovery scores, and 11 other unnamed models. They found overall GRADE quality of evidence was low, but strongest for 5P which was the only externally validated model. A meta-analysis of the 5P PPM revealed low heterogeneity, but all six studies were deemed to have a high risk of bias due to the inclusion of symptoms both as predictors and outcomes.

The problem of the use of various definitions of concussion further complicates systematically reviewing these PPM. Four studies used the Concussion in Sports Group definition. Thankfully, PPCS was similarly defined based on the ICD-10 description. The 5P model, like other models included, predicts which patients will have PPCS based on a number of variables as a binary (ie, yes/no) outcome and performed slightly better than physician gestalt.

Editor’s Comments: Concussion science continues to evolve as there is a large and growing body of evidence about this potentially highly life-altering condition. Given the large number of studies examining outcomes in children after concussion, synthesizing the results presents a challenge as various definitions of concussion are employed. The 5P currently appears to be the best available predictive tool for PPCS in children after mTBI. Further external validation of other PPM is needed to determine which other tools may have clinical value. ■

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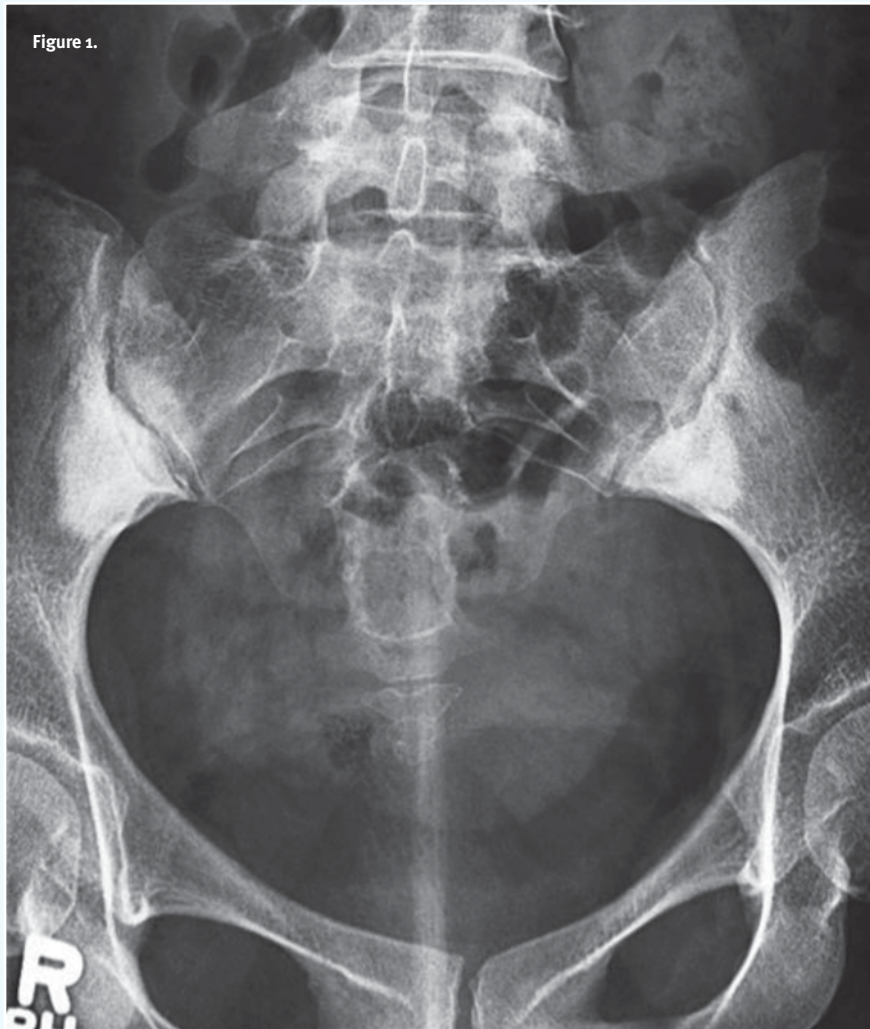
GET STARTED





Challenge your diagnostic acumen: Study the following x-rays, electrocardiograms, and photographs and consider what your diagnosis might be in each case. While the images presented here are authentic, the patient cases are hypothetical. Readers are welcome to offer their own patient cases and images for consideration by contacting the editors at editor@juqm.com.

30-Year-Old With Back Pain

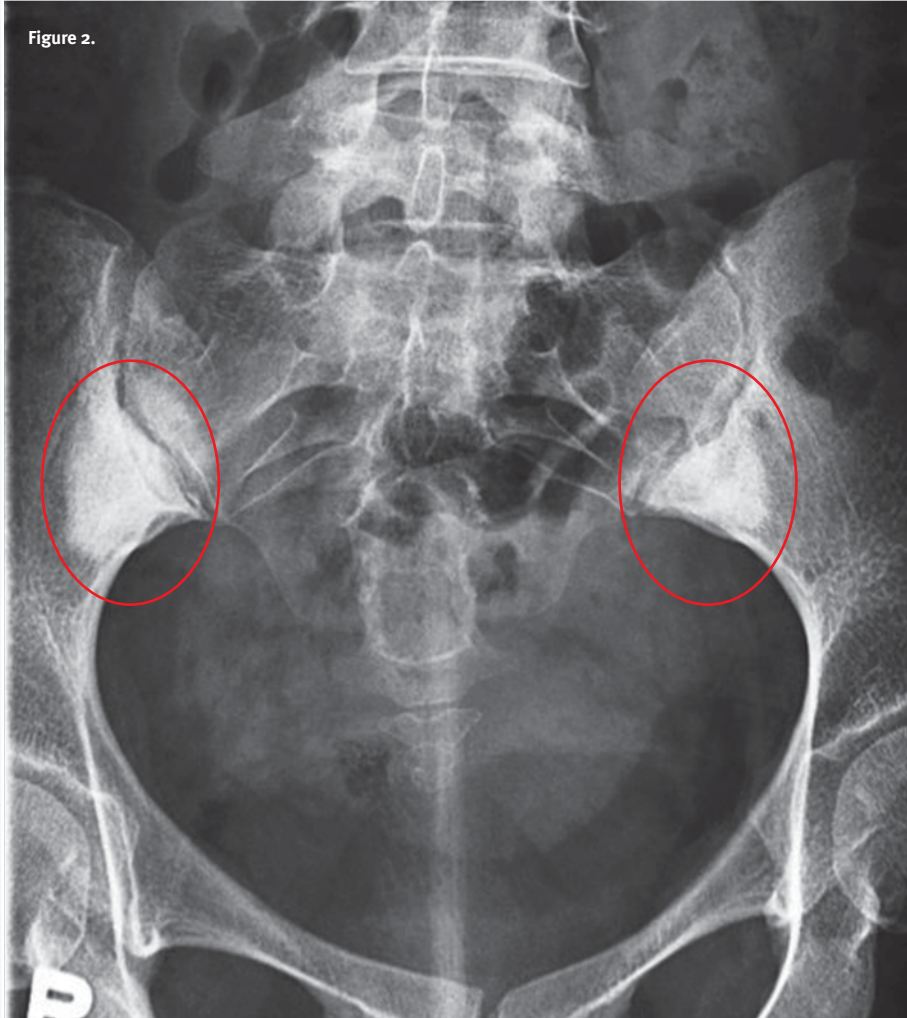


A 30-year-old woman presents to urgent care with pain in her lower back and pelvis. She denies any injury or accident that might be causing her pain. She has just returned to full-time work after having a baby. An x-ray is ordered.

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

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

Figure 2.



Differential Diagnosis

- Sacroiliac joint osteoarthritis
- Sacroiliitis
- Osteitis condensans ilii
- Ankylosing spondylitis

Diagnosis

The correct diagnosis in this case is osteitis condensans ilii. This x-ray shows triangular sclerosis of the bilateral iliac sides of sacroiliac joints. Minimal sclerosis of the right sacrum adjacent to the joint is observed. With osteitis condensans ilii, the sacroiliac joint is normal with no irregularity, erosions, or loss of joint space.

What to Look For

- Characterized by benign sclerosis of the ilium adjacent to the sacroiliac joint, it is typically bilateral and triangular in shape.
- The condition is usually asymptomatic but may cause axial lower back pain, buttocks or thigh pain—typically not centered over the sacroiliac joints.
- While osteitis condensans ilii has a low incidence, it is more common in women than men. In women, it is seen primarily in pregnancy and the puerperium period after giving birth.

Pearls for Urgent Care Management

- Osteitis condensans ilii is benign and self-limited.
- Initial treatment is with anti-inflammatory medications, physical therapy, and rest.



25-Year-Old With Hand Rash



A 25-year-old man undergoing chemotherapy with cyclophosphamide, vincristine, doxorubicin, and dexamethasone for acute lymphoblastic leukemia arrives in urgent care because he's developed a painful, burning palmar eruption. On examination, tender, shiny, erythematous papules and plaques were seen on the palms and fingers as well as the soles of his feet.

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

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

**Differential Diagnosis**

- Acquired palmoplantar keratoderma
- Toxic erythema of chemotherapy
- Drug-induced phototoxic reaction
- Erythromelalgia

Diagnosis

The correct diagnosis in this case is toxic erythema of chemotherapy (acral erythema, palmoplantar erythrodysesthesia, or hand-foot syndrome). It can occur following treatment with several systemic chemotherapeutic agents, although the pathogenic mechanisms are unknown.

What to Look For

- It is characterized by a painful erythematous rash, often with associated edema located on the palms, fingers, and soles, preceded by dysesthesia.
- Typically, reactions occur 24 hours to 3 weeks after chemotherapy begins, and more severe cases may occur with bolus chemotherapy than with low-dose continuous infusion.
- Pain may be severe and impact daily activities.

Pearls for Urgent Care Management

- Symptoms usually resolve 2-4 weeks after discontinuation of the causative agent
- Symptoms may resolve with dose reduction of the causative agent
- High potency topical corticosteroids applied 2 times daily can help
- Supportive treatment includes wound care, emollients, and analgesic pain medications



59-Year-Old With History Of Hypertension

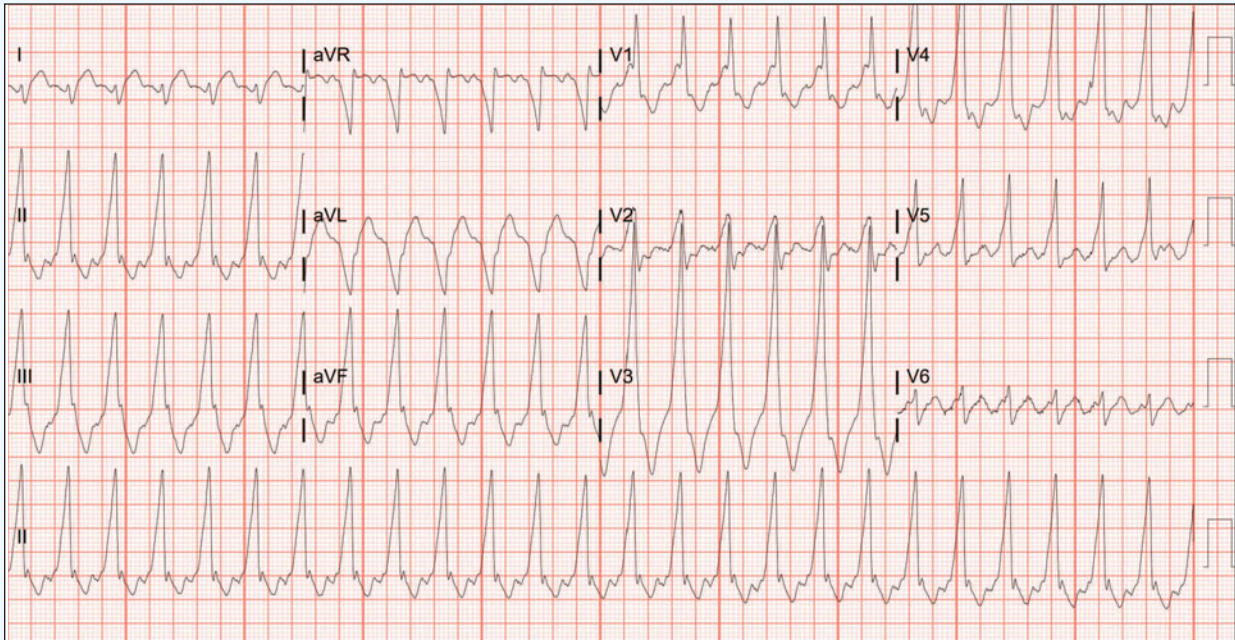


Figure 1: Initial ECG

A 59-year-old male with a past medical history of hypertension presents with dyspnea and pleuritic chest pain in urgent care, and 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 Gabriel Millare, MD, PGY3 at UTHealth Houston.

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



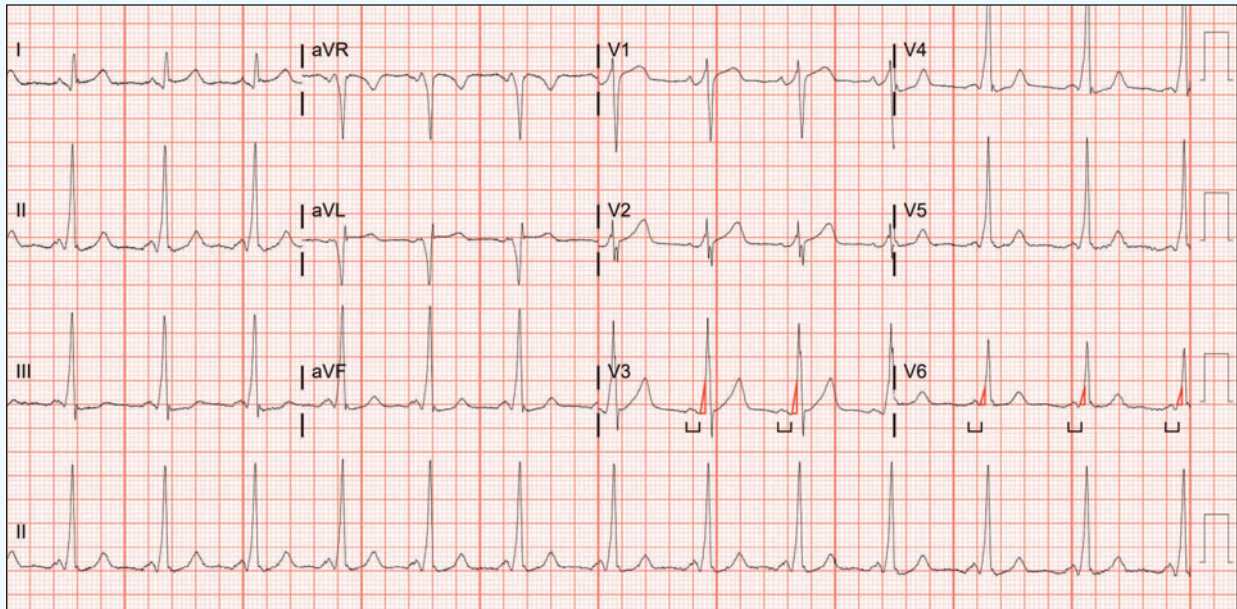


Figure 2: Post-conversion ECG demonstrating short PR interval (brackets) and the delta wave (red triangles) best seen in leads V₃ and V₆.

Differential Diagnosis

- Ventricular tachycardia
- Supraventricular tachycardia with aberrancy
- Antidromic atrioventricular reentrant tachycardia
- Sodium channel toxicity
- Hyperkalemia

Diagnosis

The diagnosis in this case is antidromic atrioventricular reentrant tachycardia (AVRT). The ECG reveals a fast rate of 156 beats per minute, with P waves difficult to appreciate. There is a left axis deviation and a wide QRS complex. Appreciable ST segment changes are difficult to see with this fast rate.

The differential for regular wide complex tachycardia includes:

- Ventricular tachycardia
- Supraventricular tachycardia with aberrancy
- Antidromic atrioventricular reentrant tachycardia
- Toxicologic/metabolic disturbances.¹

Eighty percent of wide complex tachycardia is ventricular tachycardia. Several algorithms have been developed to differentiate ventricular tachycardia from other causes of wide complex tachycardia; however, their use in the clinical setting has shown low reproducibility, and it is safest to presume ventricular tachycardia in the absence of compelling information to suggest otherwise.²⁻⁶

The wide complex tachycardia in **Figure 1** looks like ventricular tachycardia and should be treated as such. This

patient was transferred to an emergency department, where the patient was electrically cardioverted. The post conversion ECG demonstrated ventricular pre-excitation evidenced by the short PR interval and slurred upstroke (ie, delta wave, **Figure 2**). The arrhythmia was confirmed to be antidromic AVRT. **Figure 2** shows a sinus rhythm with delta waves seen near the onset of the QRS complexes. The patient's symptoms improved, and he was admitted for a cardiac ablation.

Pre-excitation happens when the ventricle begins to depolarize earlier than normal. This happens when an accessory pathway between the atria and the ventricles (often referred to as the bundle of Kent) conducts a signal to the ventricles slightly before the normal conduction system can.⁷ When the accessory pathway pre-excites the ventricles, the ECG will show characteristic features: a shortened PR interval and delta waves. When dysrhythmias occur involving the accessory pathway, it is referred to as the Wolf-Parkinson-White syndrome. Antidromic AVRT is a macro reentrant circuit in which the signal travels antegrade through accessory pathway and retrograde through the atrioventricular node (**Figure 3**). It can be treated with procainamide or electrical cardioversion.

What to Look For

- 80% of wide complex tachycardia is ventricular tachycardia
- Always obtain a post-conversion ECG and look for evidence of pre-excitation

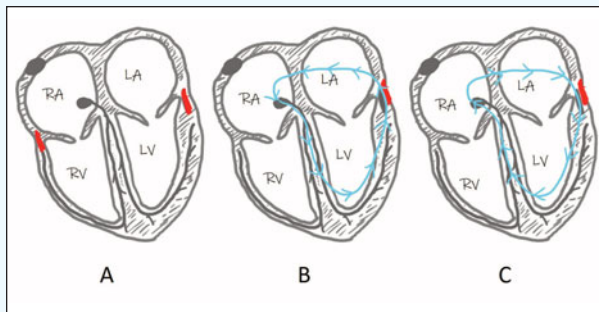


Figure 3: Orthodromic and antidromic atrioventricular reentrant tachycardia. The red bars in panel A represent possible locations of the accessory pathway (type A, between LA and LV; type B, between RA and RV). The blue line in panel B represents orthodromic conduction (narrow complex) and the blue line in panel C represents antidromic conduction (wide complex). RA: right atrium; RV: right ventricle; LA: left atrium; LV: left ventricle.

- Pre-excitation on the resting ECG is demonstrated by a short PR interval and a slurred upstroke of the QRS complex (eg, delta wave)

Pearls for Initial Management, Considerations for Transfer

- Treatment options for most cases of wide complex tachycardia include electrical cardioversion and procainamide

- All wide complex tachycardias should be immediately transferred to an emergency department
- Since most regular, wide complex tachycardia is ventricular tachycardia, decompensation into cardiac arrest can happen quickly and unpredictably, so get the automated defibrillator and have it ready and next to the patient while awaiting emergency medical services

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Look Ahead For RCM Success

■ Heather Rothermel

We are deep into the fourth quarter of 2024, and it is important to lay the groundwork for revenue cycle management success in 2025. Following are some points to consider in your strategic plan for next year.

Contract Renegotiations

Understanding your payer agreements and your patient population will be instrumental to successful contract renegotiations in 2025. Once your agreement has met its initial term, you can approach your payer partners to discuss renegotiations. It's best to start this process well ahead of your anniversary date to give yourself and the payer adequate time to do scenario planning.

While preparing for renegotiations, gather data on how many visits you have delivered for the members of each specific payer and document what sets you apart from your competitors. It is important to know your cost per visit and to approach the payer with a clear vision of where you want to go.

Consider your online reviews, ancillary services, and hours of operation when preparing your proposal. Frame the visits that helped plan members avoid costly emergency department encounters. Emphasize your care quality whenever possible. Not all payers are open to or are able to renegotiate reimbursement. Typically, Blue Cross Blue Shield, Medicare, Medicaid, and Tricare will not consider renegotiating, meanwhile, Medicare Advantage and managed Medicaid plans rarely reimburse over 100% of the current fee schedule.

Updated Documentation

Often the payers will require updated documents to maintain your participation. Updating files for your entity regularly will set you up for success as you receive payer recredentialing notices. Licenses, board certifications, certificates of insurance, CLIA certificates, business licenses, and W-9s are all

examples of documents that have expiration dates or need to be updated annually.

Planning ahead and having complete files allows you to respond quickly to requests that come your way. It is important to update each provider's profile with the Council for Affordable Quality Healthcare to reflect their current documents, which ensures that payers who use this platform have accurate information. Ensuring that your credentialing vendor has updated records will help it complete any future credentialing or recredentialing applications without delay.

Recredentialing

Each payer has their own timeframe and process for recredentialing your clinical providers as well as your facility. Keep track of each payer's credentialing requirements, your effective dates, and the timing of each recredentialing process for 2025. Recredentialing requests can come via e-mail or postal mail, arriving at an individual clinic, the enterprise location, or to your credentialing vendor.

During the pandemic, some payers paused their recredentialing processes, however, since the official end of the public health emergency, payers have started to move forward with recredentialing efforts again. Is important to confirm whether your payers have reinstated these processes and to understand when recredentialing is due. Missing a recredentialing date can have major impact to your practice—everything from notifications to members that your clinic/clinician is no longer in network to lost time while a provider is out of network and working through the credentialing process again. All this can add up to lost revenue and reduce your retention rates.

Consider What's Beyond

As you consider your hands-on processes, consider how you might further leverage automation to reduce manual work and the costs associated with it. There's no doubt that the future of revenue cycle management includes some degree of artificial intelligence, and laying the groundwork now to adopt these technologies will make your glidepath smoother.

Spending time in preparation will help you drive operational success in 2025. ■



Heather Rothermel is Contracting Operations Lead for Experity.

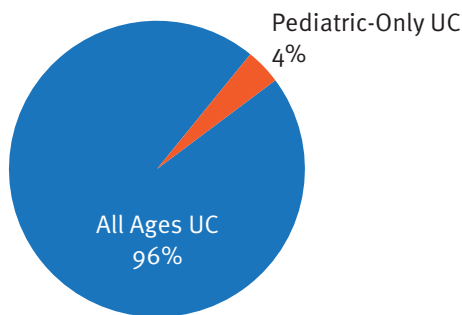


Size and Ownership of U.S. Urgent Care Centers

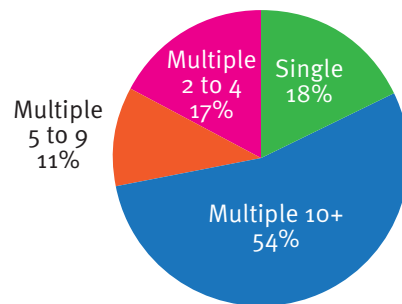
■ Alan A. Ayers, MBA, MAcc

CHARACTERISTICS OF URGENT CARE CENTERS

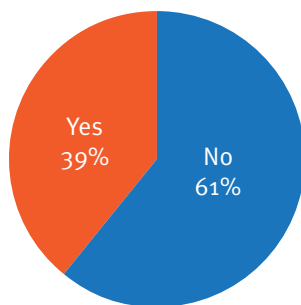
Patient Population



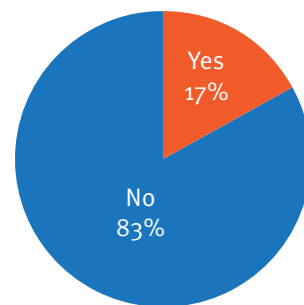
Number of Urgent Care Locations by Operator



Affiliated with Hospital or Health System



Private Equity Ownership



As of September, 2024, there are a total of 14,245 urgent care centers in the United States, according to National Urgent Care Realty data. The charts above break down the footprint of urgent care centers by hospital affiliation, number of locations per operator, ages seen, and setting.

From the data:

- 96% of urgent care centers treat all ages, whereas 4% specialize exclusively on pediatric populations
- 39% of urgent care centers are affiliated with a hospital or health system, while 61% are unaffiliated
- 18% of urgent care centers are single unit operations, while 82% are part of multi-unit footprints
- 17% of urgent care centers have received investment from private equity portfolios, whereas 83% have not ■



Alan A. Ayers, MBA, MAcc is President of Urgent Care Consultants and Senior Editor of *The Journal of Urgent Care Medicine*.

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