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How Changes in Team Composition Affect Performance: What Urgent Care Can Learn from the Sports World

Ivan Koay MBChB, MRCS, FRNZCUC, MD

Optimal team dynamics play a key role in productivity and enterprise success. The importance of a well-functioning team is evident every day in urgent care centers (UCCs). Increasingly, rapid turnover of UC staff is becoming normative, and changes in team composition can have significant impact on how well a team functions. Whether from daily shift changes or staff joining or leaving the organization, such changes require adaptations both for the loss of old team members and in the efforts to determine appropriate roles when new members join.

Similarly, in many sports organizations, free agency, injuries, trades, and drafts lead to near constant alterations in team composition. There is much that can be learned from how sports teams cope with such changes and applied to UC.

A team's ability to adapt and continue to function in light of changes in membership has an obvious impact on their collective success—regardless whether the objective involves winning a game or caring for patients. In their recent study, Pasarakonda et al. investigated unexpected events that occur during task execution and specific performance episodes due to sudden changes in team composition.[1] The study analyzed English Premier League (EPL) soccer teams' performances when there were events that disrupted membership. The authors hypothesized that alterations in team composition that were characterized by the loss of a team member would adversely affect team performance and game outcomes. The researchers specifically examined the impact of familiarity—whether team members knew each other or not—on coordination of the team. They also looked to delineate the effects that various types of composition changes (eg, loss of a teammate, substitution, etc.) had on team function and the outcomes of events. Their findings offer important lessons for UC clinicians and administrators on how such disruptions to team dynamics are likely to affect performance.

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"Over time and with increasing shared experience, teams establish a sense of shared knowledge, which enhances communication"

Team Familiarity and Performance

Team familiarity—defined as the shared experience a team has of working together—has been shown in various sectors to improve performance. When team members have experience handling a variety of situations together, they learn how other members react to different demands and the skill sets and capabilities of their teammates. Team members learn to combine information about a situation at hand—whether that be a seizing patient or a three-goal deficit at halftime—with previous performances, which then provides an intuitive sense for the likely actions of fellow team members.

Over time and with increasing shared experience, teams establish a sense of shared knowledge, which enhances communication. Increases in team familiarity not only results in more profound communal knowledge but also enables complex coordination of responses to familiar patterns. Enhanced levels of familiarity have been connected to higher levels of trust among team members

that serve the team well when faced with task disruption. Team familiarity also creates resilience against some of the negative effects of team composition changes.

"When there is a loss of a team member with no immediate substitute available, UC managers might focus on hiring a replacement who can adapt swiftly."

Team Composition Disruptions

In their study analyzing EPL soccer teams over 3 consecutive seasons, Pasarakonda and colleagues found that the duration of adversity a team experiences as a consequence of losing a team member negatively affected team outcomes. In other words, the longer the team had to work without the dismissed team member, the worse the team functioned. Moreover, teams' ability to maintain or recover performance after the loss of a teammate was mitigated when another player was substituted in quickly.

This study highlights the fact that when teams lose a member, it appears critical to replace that individual as soon as possible because not doing so seems to have a more profound negative effect on performance. In contrast, when teams were forced to substitute a team member due to injury, teams were able to maintain performance by redistributing their resources and roles adequately, which helps the team conserve its resources. This implies that the loss of a team member is a more harmful form of team composition disruption than the substitution of a team member.

In the UC setting, these findings can inform hiring, staffing, and scheduling decisions. Ensuring that roster gaps are filled as soon as possible—particularly in cases of short notice absences related to illness and the like—would prevent excessive detriment to team function.

For example, operating in a short-staffed capacity when someone calls out sick would likely lead to less optimal function for the team than having an on-call backup member fill in. This may seem obvious, but it is a far too common reality that UC teams are asked by their leadership to maintain unaltered performance when team members are unexpectedly absent.

Transferring Learnings to UC

In most UCCs, there are a variety of staff members with various scopes of practice and skill sets. Effective teamwork among them ensures optimal patient flow. This begins with the "front of the house" reception team and extends to the medical assistants, physician assistants, nurse practitioners, and/or physicians caring for the patients. Other ancillary staff, such as janitorial staff and business administrators, also need to be considered for their role in maintaining an efficient UCC. Managers of organizations should be aware of the downsides that the loss of a team member has on team coordination and performance. As the current labor shortages abound, this is a challenge for many UC organizations.

Suboptimal team performance due to understaffing is not frequently discussed as a source of job-related stress, but it certainly can and does affect job satisfaction. This then can create a vicious cycle of team member departures as team familiarity and function deteriorate and the work becomes increasingly stressful with each subsequent loss of an employee. Appreciating the importance of a functional team and prioritizing retention reduces the likelihood of unexpected resignations and thereby helps organizations avoid the high costs of turnover, such as recruiting, onboarding, and paying premiums for temporary/locums staffing.

Team familiarity was also demonstrated to be an important determinant of a team's ability to adapt in the study. UC managers and team leaders might consider how familiar team members are with one another when creating schedules. When there is a loss of a team member with no immediate substitute available, UC managers might focus on hiring a replacement who can adapt swiftly. Seeking referrals from a network of qualified candidates who already are familiar with some of the current team members (eg, friends or former colleagues) can also reduce time for team familiarity to resurge.

Teamwork is foundational to optimal UCC performance. UCC administrators who care about throughput, patient experience, and efficiency metrics would be wise to pay attention to the findings of Pasarakonda and colleagues as they pertain to what helps and hampers team function. Creating an environment where the UC team can thrive may not always make sense from a short-term financial perspective, however, it is critical to the long-term success of UCCs and the well-being of the individuals who care for patients every day. ■

References

1. Pasarakonda S, Maynard T, Schmutz J, et. al. How Team Familiarity Mitigates Negative Consequences of Team Composition Disruptions: An Analysis of Premier League Teams Group & Organization Management 2023, Vol. 0(0) 1–56

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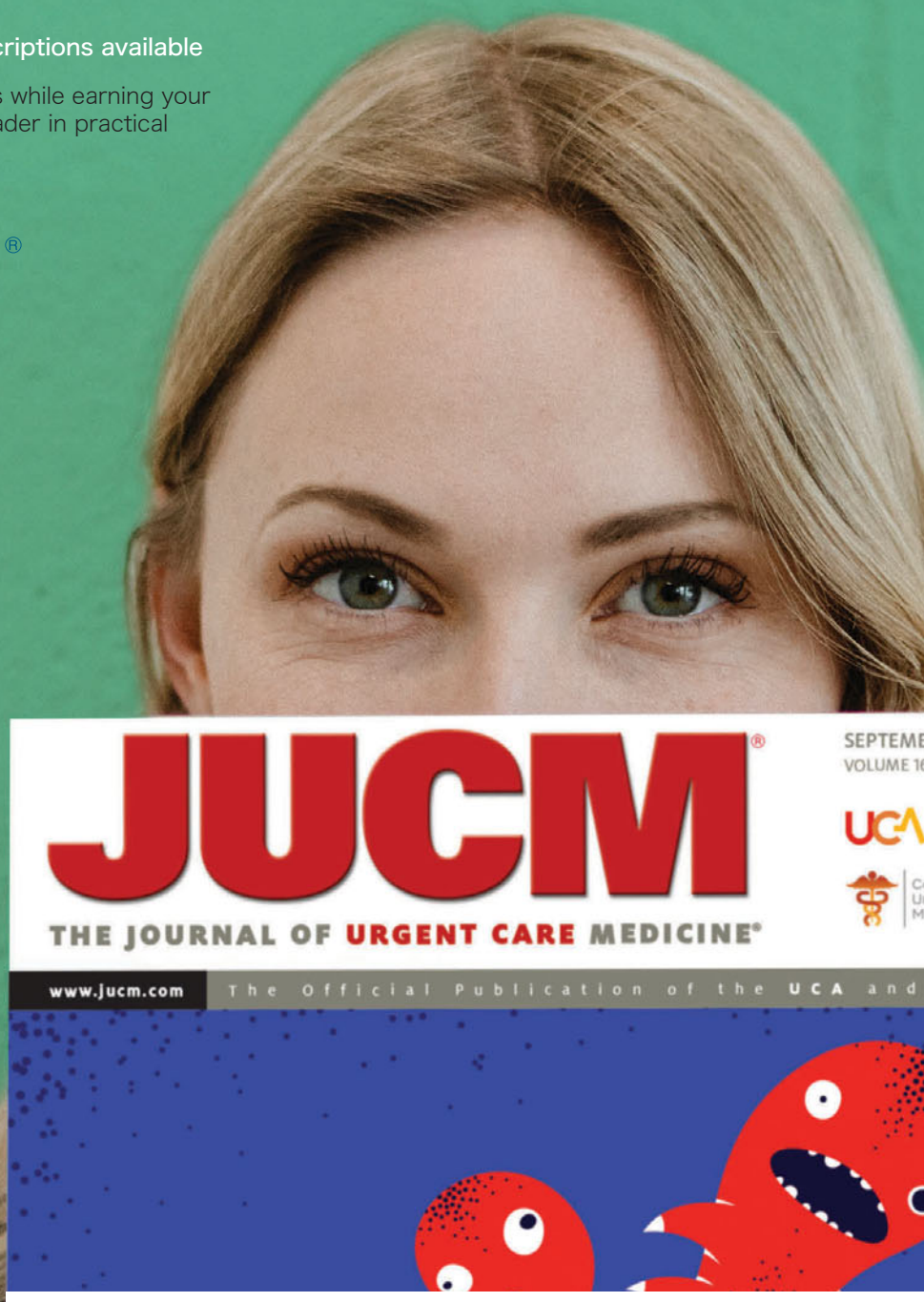

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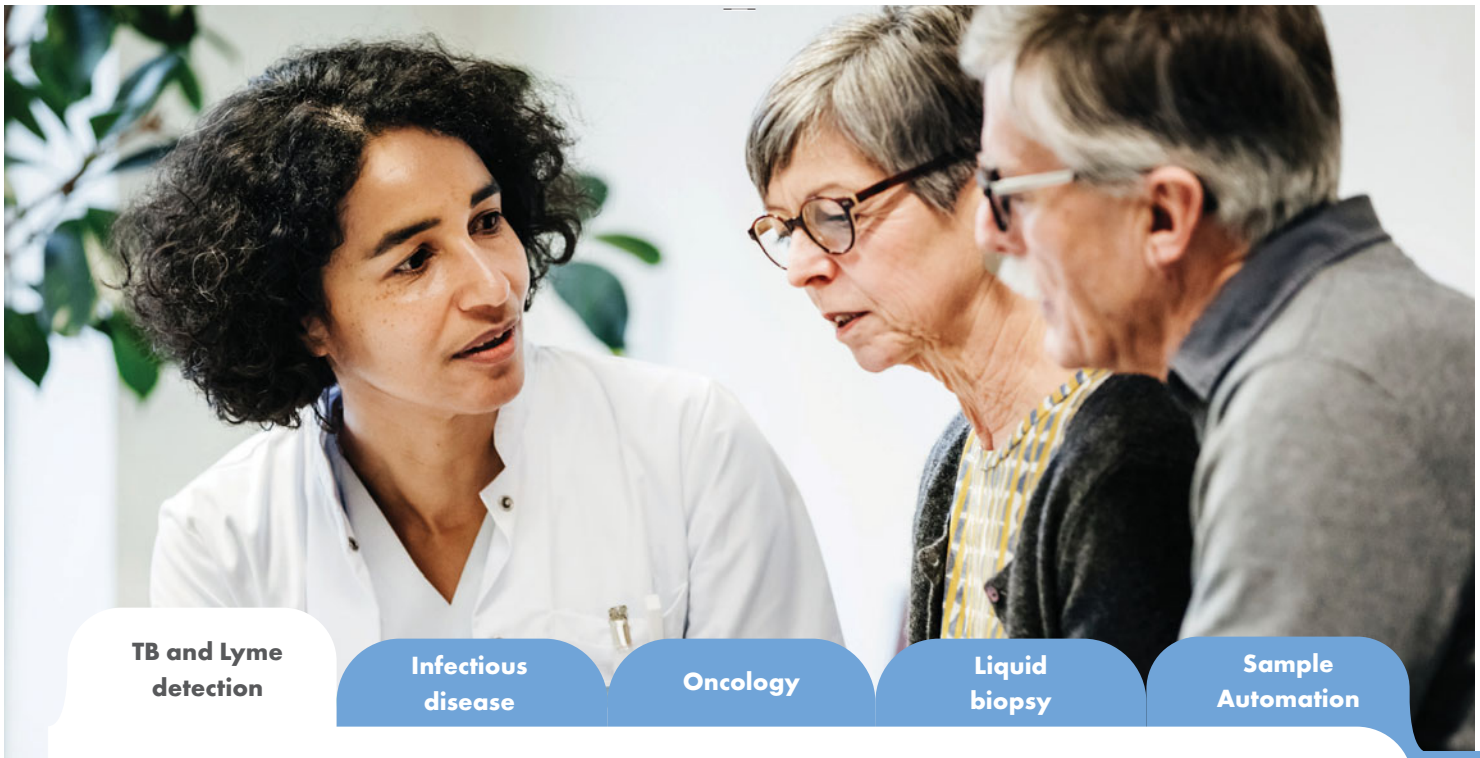

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References:
1. USPSTF. Screening for latent tuberculosis infection in adults: US Preventive Services Task Force recommendation statement. JAMA. 2016; 316: 962–969.

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JUCM The Journal of Urgent Care Medicine (ISSN 19380011) supports the evolution of urgent care medicine by creating content that addresses both the clinical practice of urgent care medicine and the practice management challenges of keeping pace with an ever-changing healthcare marketplace. As the Official Publication of the Urgent Care Association and the College of Urgent Care Medicine, *JUCM* seeks to provide a forum for the exchange of ideas regarding the clinical and business best-practices for running an urgent care center.

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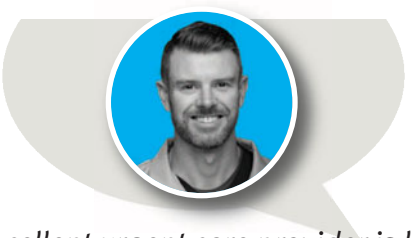

"Being an excellent urgent care provider is like being an excellent cover band. A good cover band knows 20-30 songs, but they know them cold. They're not expected to be able to play any and all music well off the cuff. In urgent care, we have to know how to manage 20-30 common presentations and the associated guidelines cold."

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

"When it comes to pediatric injuries, children will show you before they tell you that they are in pain. Pediatric x-rays can be deceiving. Trust your physical exam first and x-rays second."

— Brittany Wippel, MD
JUCM Pediatric Editor

"If it's not in the differential, it won't be in the diagnosis."

— Michael Weinstock, MD
JUCM Senior Clinical Editor

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To Evolve is to Succeed

Scott Prysi, MD

For the last 30 years, Urgent Care centers have been transforming healthcare by moving the patient to the center of care—that means serving patients with urgent medical problems with extended hours and onsite X-ray and lab services when and where they want it. We operated throughout the pandemic when virtually all other healthcare access points closed, and we came out stronger with new relationships with local hospitals and health departments as well as a heightened reputation in the eyes of our patients. Since then, many of us have added additional service lines like primary care and behavioral health to meet the needs of our communities. This evolution from the "doc in a box" days will continue with the incorporation of new technologies and further integration of scheduling and access processes into our practices over the next few years. I'm excited about the future of our industry.

The Urgent Care Association (UCA) is a thriving, dynamic organization that continues to evolve and explore new ideas while staying focused on our mission: to ensure the advancement and long-term success of Urgent Care. Through the College of Urgent Care Medicine, we're working toward a specialty designation for our members, which will give us the clout to develop our own code set. Through the Urgent Care Foundation, we're raising awareness of our field in the healthcare ecosystem and public domain. Over the coming year, there will be some significant changes within the organization with expanded lobbying efforts, the introduction of a new CEO and a Board of Directors reinvigorated with the talents and enthusiasm of two new members. Change always leads to new opportunities, and I'm confident we'll search out and find those opportunities as we grow as an organization.

Two priorities for the immediate future are building on the legislative momentum we've started in Washington with our lobbyist partner McDermott+ and expanding our regional chapters. Achieving bipartisan support from legislators on our letter to the Centers for Medicare and Medicaid Services in support of Urgent Care was a big win for our Advocacy team and sets us up nicely for further lobbying efforts. Financial support from the membership for this activity will be important going forward, and I hope everyone will answer the call to donate to our Advocacy fund to ensure this momentum is able to continue.

The growth and support of our regional chapters is another priority. Raising the awareness of Urgent Care can be done at the national level, and it will be, but it's more successful with grassroots efforts at the state level. New regional chapters are being developed to make this happen, and UCA is creating the framework to develop and support them.

As you know, CEO Lou Ellen Horwitz will step down later this year. The search for our new CEO started in late 2023 with the creation of a detailed job description, written by the CEO Search Committee. The position was officially posted at the beginning of March, and we've received over 700 applications to date. The committee is working through the candidates to get to a manageable interview pool with interviews expected to run through the summer. The quality of applicants has been amazing, and I'm confident we'll end up with a very talented and committed leader for this next stage of UCA's growth.

An organization is only as strong as its membership and its leadership from the Board of Directors. I want to thank two members rotating off the Board this year: Dr. Max Lebow and Mike Dalton. Between them, they have given 13 years of service to UCA, and their dedication and hard work have made us a stronger organization. And last but not least, I want to thank our Immediate Past President, Dr. Payman Arabzadeh, for his leadership, diplomacy, and grace as our president this past year. I am honored to continue the legacy of the incredible UCA presidents before me, and I look forward to working with the Board and all of you in the coming year to continue the advancement and ensure the long-term success of Urgent Care. ■

Scott Prysi, MD is the new President of the Urgent Care Association.

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3. To provide unbiased, expert advice regarding the management and operational success of urgent care practices
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A Review of Genital Mycoplasma and Ureaplasma Infections for the Urgent Care Clinician (page 13)

1. **Which of these statements is true about *Mycoplasma* and *Ureaplasma* species of bacteria?**
   a. They can produce a variety of genitourinary symptoms in males and females
   b. They only produce symptoms in males over age 50
   c. They only produce symptoms in females
   d. They never produce symptoms

2. **What is the incubation period for *Mycoplasma* infection?**
   a. 1-2 days
   b. 1-2 weeks
   c. 1-2 months
   d. 1-2 years

3. **Which recommendation might be given to patients with *Mgen* infection?**
   a. Abstain from sexual contact until asymptomatic and appropriate therapy has been completed
   b. Resume normal activities at any time
   c. Resume normal activities after 1-2 days
   d. None of the above

Expanding the Differential of Thunderclap Headache Beyond Subarachnoid Hemorrhage: A Case Report (page 21)

1. **One mnemonic screening tool for "red flags" that suggest a higher risk for dangerous etiologies of headache is:**
   a. SNNOOP10 criteria
   b. CNIII
   c. ICD-10
   d. None of these

2. **Thunderclap headache is characterized by:**
   a. Headache only while lying down
   b. High-intensity headache with abrupt onset
   c. Headache with fainting
   d. Shoulder pain

3. **The imaging of choice for evaluating for cerebral venous thrombosis is:**
   a. Computed tomography
   b. Magnetic resonance venography
   c. X-ray
   d. Either A or B

Urgent Care Evaluation and Management of Boxer's Fractures (page 32)

1. **A boxer's fracture is a fracture of the:**
   a. Hamate
   b. Lunate
   c. Capitate
   d. 5th metacarpal neck (little finger)

2. **A laceration that accompanies a boxer's fracture might be the result of which type of injury?**
   a. Fight bite
   b. Fight fracture
   c. Dancer's fracture
   d. Gamekeeper's thumb

3. **For patients with fight bites, what steps can urgent care clinicians take?**
   a. Aggressive wound care with copious irrigation
   b. Assessment for fracture
   c. Prophylactic antibiotics
   d. All of the above

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See CME post-test questions on page 11.

A Review of Genital Mycoplasma and Ureaplasma Infections for the Urgent Care Clinician

Urgent Message: Mycoplasma species, most notably *Mycoplasma genitalium* are an increasingly recognized etiology of persistent urethral discomfort and non-gonococcal urethritis in males. These infections are commonly asymptomatic and can also have significant consequences in females. Antibiotic resistance is a common concern, and treatment recommendations differ significantly from those for other sexually transmitted infections.

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Clinical Scenario

A 23-year-old male presented to urgent care (UC) with 5 weeks of persistent, mild, non-purulent penile discharge and urethral discomfort. He reported having condomless sex with both male and female partners in the prior 6 months since he last had sexually transmitted infection (STI) testing. He was seen 2 weeks prior with a urine dip showing trace leukocyte esterase (LE), a negative polymerase chain reaction (PCR) test for gonorrhea (GC) and chlamydia (CT) and a negative urine culture. At the second visit, his genitourinary (GU) exam revealed no scrotal swelling or tenderness and scant, mucoid urethral discharge. The patient subsequently underwent urine PCR testing for *Mycoplasma genitalium,* which was positive, and he was treated with 7 days of doxycycline followed by 7 days of moxifloxacin.

Introduction and Background

Mycoplasma is a genus of atypical bacteria within the class *Mollicutes*. There are over 200 named *Mycoplasma* species, but only a limited number of which have been identified in the human genitourinary tract: *Mycoplasma*

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Table 1. Situations in Which Testing for *Mycoplasma genitalium* is Recommended

Population	Situations in Which Testing for *Mycoplasma genitalium* is Recommended (European Guidelines, JEADV, 2021)	Level of Evidence
General	Ongoing sexual contact with partners treated for M. genitalium infection	1B
	Proctitis after exclusion of GC and CT as causative pathogens	1D
Males	Symptoms of urethritis	1B
	Acute epididymitis or orchitis if <50 years	1B
Females	Mucopurulent cervicitis	1B
	Intermenstrual or post-coital bleeding	1B
	Dysuria with no known other etiology	1B
	Acute pelvic pain and/or PID	1B

genitalium (Mgen), M. hominis, M. fermentans, M. penetrans, Ureaplasma urealyticum, U parvum.[1,2] Note that despite the difference in genus name, *Ureaplasma* organisms are also *Mycoplasma* species.

Mycoplasma spp. have proven to be difficult organisms to study due to the frequency of asymptomatic carriage, co-infection with other urogenital pathogens that cause similar symptoms, design limitations in studies performed, and difficulty in culturing the organisms.[1]

Although the presence of the 6 *Mycoplasma spp.* mentioned above are frequently asymptomatic, any of them can cause a variety of symptomatic infections and complications ranging from pneumonia, spontaneous abortion, infectious arthritis, meningitis, bacteriemia, and various neonatal complications such as preterm birth and bronchopulmonary disease.[1,3,4,5] Asymptomatic urogenital colonization is common but may also result in symptomatic urethritis and epididymitis in males and cervicitis, pelvic inflammatory disease (PID), and infertility in females.[6]

This review focuses on *Mgen,* given that it is the most likely *Mycoplasma spp.* to result in symptomatic urogenital disease, however, other organisms in this class may be identified incidentally when testing for a cause of unexplained urogenital symptoms.

Prevalence

According to a 2018 systematic review and meta-analysis, the prevalence of *Mgen* in the general population was 1.3% in higher-income countries and 3.9% in low- and middle-income countries. Prevalence was similar between males and females. In asymptomatic patients, the prevalence across studies was 0.8%. Additionally, prevalence in specific groups showed rates of 0.9% among pregnant people, 3.2% among males who have sex with males (MSM), and 15.9% among female commercial sex workers (CSWs).[7] Co-infection with other STIs such as GC, CT, and human immunodeficiency virus (HIV) have also been shown to correlate with an increased prevalence of *Mgen.*[8,9,10]

The rates of adult urogenital *mycoplasma spp.* colonization is between 1-2% with increased rates among people with more frequent condomless sex and/or higher numbers of total sexual partners.[9,11] MSM who are HIV-positive also have significant risk of *Mgen* rectal colonization, however, they commonly are asymptomatic.[10,12]

Modes of Transmission

The primary mode of transmission for *Mgen* is through direct mucosal contact during vaginal or anal sex.[13] Outside of urogenital symptoms, rectal colonization is similarly common compared to urogenital colonization, however, anorectal symptoms are less likely to occur than with urogenital infections.[8] Although studies are limited, *Mgen* appears to be dissimilar from other STIs in that it does not appear to be easily transferred and/or cause symptoms with oral-genital contact.[14,15] Data are sparse on the efficacy of condoms at prevention of *Mgen*, however barrier use is still recommended as a means of prevention.[3,8]

Clinical Presentation

The incubation period of *Mgen* is estimated to vary from 4-8 weeks after exposure. This extended incubation period relative to other bacterial urogenital pathogens (eg, GC, CT) is attributed to the slow-growth and reproductive rate of *mycoplasma*.[16] Penile or vaginal discharge and urethral pain are common symptoms, but infections have been reported to be asymptomatic in up to 90% of cases in males and in 60% of cases in females.[17]

Up to 35% of cases of non-gonococcal urethritis

Table 2. Identifying Patients Who Benefit From *Mgen* Testing	
	Testing Recommendation for *Mgen* (CDC guidelines)
Asymptomatic patient	**No**
Antibiotic resistance testing in patients who test positive	**Yes,** if available*
Test of cure	Only when antibiotic resistance testing is not available and moxifloxacin cannot be used
Sexual partners of a patient who tested positive	**Yes**
Males	
NGU	**Yes,** if persistent or recurrent symptoms after treatment
Epidiymitits, orchitis	**Not specified,** European guidelines recommend testing if <50 years old
Proctitis secondary to sex	**Consider,** if symptoms continue after treatment
Females	
Mucopurulent cervicitis	**Yes,** if persistent or recurrent symptoms
PID symptoms	**Consider**
Intermenstrual bleeding, post-coital bleeding	**Not specified,** European guidelines recommend testing
Dysuria with no other explainable cause	**Not specified,** European guidelines recommend testing
**Tests for Mgen that incorporate resistance testing for macrolides and fluoroquinolones are not FDA approved and have limited commercial availability in the United States. Macrolide and fluoroquinolone sensitivity testing may be available through University of Alabama Diagnostic Mycoplasma Laboratory in Birmingham, Alabama.*[37]	

(NGU) in males and 10-25% of cases of cervicitis/PID in females are attributable to *Mgen*. Other common symptoms and presentations in males include dysuria, urethral discharge, proctitis, chronic urethritis, and/or balanoposthitis. Females with symptomatic *Mgen* infections present most commonly with dysuria, urgency, lower abdominal pain, post-coital bleeding, or menorrhagia.[3]

Although rectal colonization may occur in males and females, *Mgen* proctitis appears to be clinically rare in females.[8,18,19]

Diagnostic Testing

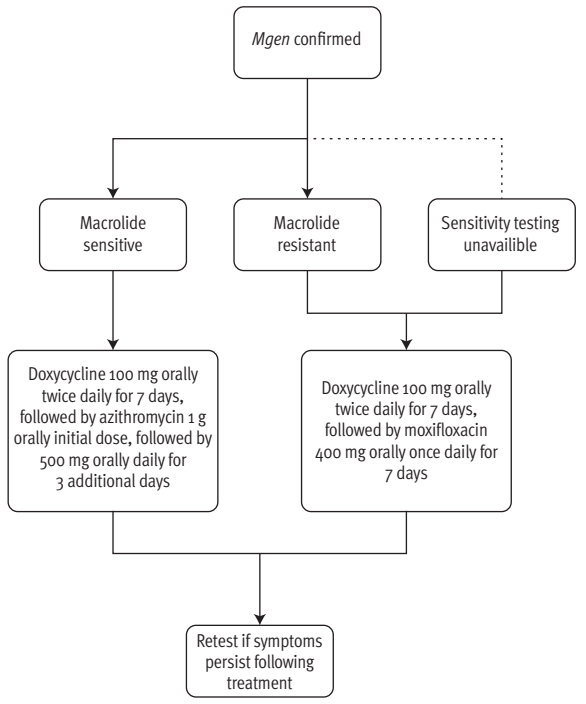
When testing is performed for *Mycoplasma spp.*, a nucleic acid amplification test, such as a PCR, is preferred. Samples can be obtained by first-void or first-catch urine from males, vaginal swabs from females, and rectal swabs. Self-collected vaginal swabs are as accurate as clinician-obtained endocervical swabs.[20] Anorectal swabs should be collected only when a patient presents with symptoms of proctitis and exclusion of GC and CT has been confirmed.[3] Other tests, such as culture and antigen, are not recommended as they have poor test characteristics and results may take an impractically long time to return. Although not often available in the US, macrolide-susceptibility testing is highly recommended where available.[3,8]

Testing Recommendations

The Centers for Disease Control and Prevention (CDC) does not recommend routine or asymptomatic testing for *Mgen* for any population but does recommend in males with recurrent NGU and in females who have recurrent cervicitis or initial presentation of PID. In cases where GC and CT have been ruled-out but *Mgen* testing is unavailable, the CDC recommends that empiric treatment should be offered for patients with symptoms of persistent/recurrent urethritis or cervicitis and considered for patients with PID.[8] Partners of patients with *Mgen* should be offered testing and treated if their test results are positive. Expedited partner therapy is not recommended.

The most recent *Journal of the European Academy of Dermatology and Venerology* (JEADV) recommendations are more comprehensive. These European guidelines recommend both testing and treatment if a patient has

Algorithm 1. CDC and JEADV *Mgen* Testing and Treatment Recommendations



Algorithm 1 does not cover cases of PID or epididymitis. In cases of PID or epididymitis where Mgen is detected, moxifloxacin 400 mg once daily for 14 days should be added to standard empiric treatment.[3,8,38]

had genital sexual contact with a partner who has tested positive for *Mgen* but has not been treated. Testing should also be performed for anyone who has ongoing sexual contact with individuals treated for *Mgen*. Testing should be considered for anyone with proctitis after GC and CT have been excluded.[3]

Testing is recommended in males presenting with signs/symptoms of urethritis or if a male below the age of 50 is experiencing acute epididymitis/orchitis, especially in cases with negative GC/CT testing and risk factors for infection by sexual history. Similarly, females should be tested if they exhibit any of the following: mucopurulent cervicitis, intermenstrual or post-coital bleeding, dysuria with no known other etiology, acute pelvic pain, and/or PID.[3] The European recommendations and their corresponding levels of evidence are summarized in **Table 1**.

Treatment Recommendations for *Mgen* in Adults and Adolescents

Mgen can be a challenging infection to eradicate. As

"The Centers for Disease Control and Prevention does not recommend routine or asymptomatic testing for Mgen for any population but does recommend in males with recurrent non-gonococcal urethritis and in females who have recurrent cervicitis or initial presentation of pelvic inflammatory disease."

such, treatment recommendations differ significantly from those for other causes of urethritis (ie, CT, GC). For example, treatment for one week with doxycycline alone has only a <40% cure rate when *Mgen* infection is present.

In a recent study, rates of macrolide resistance mutations in *Mgen* samples ranged from 51-71% in 6 US STI clinics.[21] Given high levels of resistance, macrolide-resistance testing (when available) is recommended by both the CDC and European guidelines (although none of these assays are currently approved by the US Food and Drug Administration [FDA]).[3,8,22] If *Mgen* is detected, initial treatment recommendations suggest beginning with doxycycline 100mg twice daily for 7 days followed by either azithromycin (if strain is known to be sensitive to macrolides) or moxifloxacin for 7 days if resistance testing was not performed (see **Algorithim 1**).[8] As macrolide-susceptibility testing is not available in most UC settings, the 2-stage treatment with doxycycline and moxifloxacin will likely be the standard protocol.

Moxifloxacin Safety Considerations

Fluoroquinolones have been associated with tendonitis and tendon rupture, which can occur early during the course of therapy or after completion. Compared to ciprofloxacin and levofloxacin, moxifloxacin has a weaker association with tendonitis and tendon rupture,

however an analysis of the FDA Adverse Events Reporting System reported a significant association for all three fluoroquinolones and these outcomes. Patients should be cautioned about this association and stop therapy if symptoms of tendinopathy develop during therapy.[23]

With use of moxifloxacin, weighing the possible cardiac side effects is important, as moxifloxacin is associated with the highest risk of QTc prolongation among the fluoroquinolones.[3,8,24] Before prescribing moxifloxacin, reviewing the patient's other medications and holding any non-essential medication that may affect QTc during therapy is prudent. There are no formal recommendations for monitoring, however, in uncertain cases, a baseline electrocardiogram may be helpful in ensuring the patient's QTc is not prolonged before initiating therapy. As most patients with fluoroquinolone-associated torsades de pointes (TdP) and sudden death had borderline or prolonged baseline QTc, caution is advised in such cases if prescribing moxifloxacin.[24,25]

Treatment Recommendations in Pregnant Patients

Mgen infections during pregnancy have been shown to slightly increase the risk of spontaneous abortion and preterm birth. In pregnant patients, the recommended first-line treatment is for an immediate 5-day course of azithromycin during pregnancy or otherwise postponed until after pregnancy, according to *JEADV*. However, as many strains of *Mgen* are macrolide-resistant, regardless if azithromycin is prescribed from UC, follow-up and ongoing discussion with the patient's obstetric clinician is critical. Little is known about the likelihood of *Mgen* transmission during birth and risks of neonatal infections such as conjunctivitis and/or respiratory tract infection.[3]

The CDC does not have specific recommendations for treatment during pregnancy, instead, the CDC recommends contacting STD Clinical Consultation Network (https://www.stdccn.org/render/Public) to discuss pregnant patients further.

Follow-up and Referral Recommendations

Unfortunately, the CDC guidelines do not offer much guidance regarding partner testing and treatment. This is primarily due to the limitations of the existing evidence. The European guidelines outlined in the *JEADV* do recommend that partners of patients infected with *Mgen* should be tested and treated if positive for infection.[3] Initiation of treatment for a patient with a known exposure is reasonable while awaiting PCR test results. Additionally, if there is a strong concern for partner infection and testing is not possible, EPT is appropriate.

"While uncommon, if clinical failure following treatment with both doxycycline and moxifloaxcin occurs, referral or consultation with an infectious disease expert in sexually transmitted infections is advisable."

Patients should be advised to abstain from sexual activity until after completion of treatment and symptoms have entirely resolved. Test-of-cure is not indicated in patients in whom symptoms have resolved and who received treatment; like in GC and CT infections, molecular retesting for cure may yield a false positive in the weeks following treatment due to residual genetic material.[8]

While uncommon, if clinical failure following treatment with both doxycycline and moxifloaxcin occurs, referral or consultation with an infectious disease expert in sexually transmitted infections is advisable.[26] In the US, questions can be directed to the STD Clinical Consultation Network (https://www.stdccn.org/render/Public).

Ureaplasma and Other *Mycoplasma spp.*

Like the *Mycoplasma spp*., *Ureaplasma spp*., specifically *U. urealyticum* and *U. parvum*., are a class of mollicutes that are commonly identified in the GU tract of both males and females. While FDA-approved assays test exclusively for *Mycoplasma,* multiple laboratories offer internally developed assays that test for both *Mycoplasma spp*. and *Ureaplasma spp*. with a single sample. The CDC specifically does not recommend testing for *Ureaplasma spp*.[27,28] While *Ureaplasma* are often considered normal genital flora, the presence of the organism has been associated with various GU conditions as well, making defining and managing *Ureaplasma* a clinical quandary. Notably, their presence have been associated with varying symptomatic GU diseases conditions such as bacterial vaginosis (BV), PID, and most commonly urethritis in males.[29,30]

Ureaplasma is not discussed extensively in this review given the lack of clear guidelines for testing for *Ureaplasma spp*. Additionally, antibiotic resistance of *Ureaplasma* is fairly uncommon compared to *Mycoplasma*. A recent study in the United States reported resistance in only 1 of 202 *U. parvum* isolates.[30,31] As such, doxycycline 100mg twice daily for 7 days is usually adequate for treating symptomatic patients with *Ureaplasma*. For patients with persistent symptoms after completing 7 days of doxycycline, some experts recommend to proceed with azithromycin 1g orally followed by 500mg once daily for 2 days plus metronidazole 400mg twice daily for 5 days.[31] As with *Mgen*, there is little high-quality guidance regarding partner testing and treatment. Current recommendations do suggest partners should be tested and then treated if infection is detected.[31]

M. hominins has received even less attention compared to other species of *Mycoplasma*. However, like *Ureaplasma spp*, *M. hominins* is generally considered normal genital flora, but vexingly has also been associated with varying GU conditions including cystitis, BV, PID.[32] There is no compelling evidence suggesting causation of urethritis by *M. hominis*.

It has been suggested that *M. hominis* acts symbiotically with other organisms that contribute to clinical BV. Still there are conflicting opinions on the significance of how it may affect the course of BV and causality has not been established.[32,33] There are no guidelines for differentiating treatment or testing for *M. hominins* from other *Mycoplasma and Ureaplasma spp*.[33] *M hominis* is typically susceptible in vitro to tetracycline, clindamycin, and fluoroquinilones.[32,33.] Therefore, treatment regimens for *Ureaplasma* GU infections would likely cover for *M. hominis* as well.

Immunocompromised adults are prone to *M. hominis* infections including septic arthritis, prosthetic joint infection, central nervous system infections, and infective endocarditis.[32] Neonatal infections increase risk for prematurity, low birth weight, pneumonia, bacteremia, meningitis, and chronic lung disease.[32]

The role of *M. fermentans* and *M. penetrans* in human disease are controversial. *M. fementans* has been identified in the GU tract but studies have failed to confirm a clear association of *M. fermentans* with GU pathology. Limited evidence suggests that *M. fermentans* may have a contributory role in a variety of idiopathic conditions ranging from autoimmune disease to chronic fatigue syndrome.[34,35,36] *M. penetrans* has not generally been associated with symptomatic GU infections either, but the prevalence does seem to be increased in HIV-positive patients and MSM populations for uncertain reasons. Further research is needed to clarify the role of these non-*Mgen Mycoplasma* in the etiologies of various disease states, but testing for these *Mycoplasma spp*. is generally limited to research settings at this time.[2,36]

Takeaway Points

- *Mycoplasma* and *Ureaplasma* species can produce a variety of GU symptoms in males and females.
- *Mgen* is a STI and, while frequently asymptomatic, is a common cause of NGU.
- CSW, MSM, and those infected with other STIs are at the highest risk for *Mgen*.
- The incubation period for *Mycoplasma* infections is 1-2 months and both GU and anorectal infection should be considered. *Mycoplasma* does not appear to be a significant pathogen in the oropharynx.
- The most recent guidelines from the US and Europe recommend testing in patients with suggestive symptoms who fail empiric therapy and have negative GC/CT testing.
- Given rising rates of macrolide resistance, recommended treatment involves 7 days of doxycycline followed by 7 days of moxifloxacin (unless azithromycin sensitivity can be confirmed).
- Antibiotic selection and treatment duration differ based on site of infection (eg, urethritis vs proctitis vs PID) and also for pregnant patients.
- Standard treatment includes using moxifloxacin which can have dangerous side-effects including TdP. Consider the patient's overall health carefully before treating.
- Patients should be counseled to abstain from sexual contact until asymptomatic and appropriate therapy has been completed. ■

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Case Report

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Expanding the Differential of Thunderclap Headache Beyond Subarachnoid Hemorrhage: A Case Report

Urgent Message: Cerebral venous thrombosis is a serious cause of headache that can present in a variety of manners, including sudden-onset or "thunderclap" fashion.

Caroline S. Mifsud, MS-4; Jordan L. Jones, MS-4; Michael B. Weinstock, MD

Citation: Mifsud C, Jones J, Weinstock M. Expanding the Differential of Thunderclap Headache Beyond Subarachnoid Hemorrhage: A Case Report. *J Urgent Care Med*. 2024; 18(8):21-24

Key Words: dural sinus thrombosis, cerebral venous thrombosis, headache, thrombophilia, case report

Abstract

Introduction: Acute headache is among the most frequently encountered urgent care (UC) presentations. The patient in this case presented with a severe headache and ultimately was diagnosed with a cerebral venous thrombosis (CVT).

Clinical Presentation: A 50-year-old man presented to the emergency department (ED) after he developed a sudden onset of a severe headache that occurred immediately after sexual intercourse. He described the headache as "the worst headache of [his] life" and endorsed new-onset unilateral vision changes and leg weakness.

Physical Exam and Laboratory Findings: The patient was hypertensive, but otherwise he had normal vital signs on presentation. His neurologic exam was non-focal and normal except for some mild weakness of the left lower extremity. He appeared uncomfortable. Initial labs showed only elevated glucose.

Case Resolution: Computed tomography (CT) angiography of the brain revealed a filling defect in the right transverse sinus consistent with dural sinus thrombosis. The patient was treated with heparin with subsequent

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improvement in his symptoms and was discharged to follow-up as an outpatient.

Conclusion: Headaches can suggest a variety of diagnoses, ranging from benign to life-threatening. This case highlights the importance of considering diagnoses other than subarachnoid hemorrhage (SAH) for the chief complaint of the severe, "thunderclap" headache.

Introduction

The term "cerebral venous thrombosis" (CVT) encompasses both dural sinus and cerebral vein (cortical and deep vein) thrombosis.[1,2] In this text, we will use "CVT" for consistency.

CVT most commonly presents as a new onset headache, however, the clinical presentation is highly variable. The most common risk factors for CVT include hereditary or acquired thrombophilia, prothrombotic states of pregnancy and the postpartum period, and malignancy.[3] However, risk can be increased in children with head and neck infections including otitis media, mastoiditis, and sinusitis.[4] CVT is more common in women and patients under 50 years of age.[5]

Clinical Presentation

History of Present Illness: A 50-year-old male presented complaining of a sudden onset of "the worst headache of [his] life" as well as new-onset unilateral lower extremity weakness and vision changes. He described the headache as a sudden, intense pressure sensation immediately after having had an orgasm during sexual intercourse 4 hours earlier. He reported intermittent headaches over the previous several months that were less severe.

Past Medical History: History included hypertension, anxiety, depression, hypothyroidism, and type 2 diabetes mellitus (DM2). He did not take antiplatelet agents or anticoagulation. He denied history of stroke or venous thromboembolism (VTE). He denied tobacco use but did drink "a case of beer on the weekend."

Physical Exam, Laboratory Findings, and Imaging: The patient appeared to be in significant pain. He was afebrile and had normal vital signs except for a blood pressure of 170/103. His neck was supple and nontender, and there was no evidence of head trauma. The cardiopulmonary and remainder of his general exam were normal.

On neurological assessment, the patient was alert and oriented. Cranial nerve and pupillary assessment were unremarkable. Sensation and coordination testing were also normal. Strength was full and symmetric in the bilateral upper extremities, however, he had limited ability to maintain his left leg elevated off the bed compared to the right leg.

Differential Diagnosis

The differential diagnosis for acute headache presentation is expansive and includes: primary headache disorders (eg, migraine, cluster headache, tension headache); structural etiologies of secondary headache (eg, neoplasm, hemorrhage, aneurysm); ocular pathology (eg, acute angle-closure glaucoma, iritis); vascular disorders (eg, carotid or vertebral artery dissection, cerebral vasoconstriction); central nervous system infections (eg, meningitis, encephalitis); extra-cranial infections (eg, otitis externa, sinusitis); hemorrhagic and (somewhat less commonly) ischemic cerebrovascular accident; certain toxins (eg, carbon monoxide, alcohol); and CVT.

Evaluation, Medical Decision Making, and Disposition

Given the severe and sudden-onset nature of the headache described by the patient, the initial concern would be for SAH, or other spontaneous intracranial hemorrhage (ICH), as well as carotid or vertebral artery dissection. The patient was evaluated in the ED, where a complete blood count (CBC) and a complete metabolic panel (CMP) were obtained and were found entirely normal other than a glucose of 243 mg/dL. A CT angiogram of the head and neck was obtained based on concern for SAH and/or cervical artery dissection given the sudden onset nature of the headache. This imaging study was negative for hemorrhage or arterial dissection but incidentally showed a filling defect in the right transverse sinus, concerning for CVT.

Management and Case Resolution

The patient was admitted to a medical bed and started on anticoagulation with heparin. After the initiation of heparin, the patient noted subsequent improvement in his headache, unilateral leg weakness, and vision changes. Upon further questioning during his hospitalization, the patient revealed that his daughter had a clotting disorder was on long-term anticoagulation as well. He was discharged to home on anticoagulation.

Discussion

Headache disorders are widespread with a worldwide prevalence of 46% in adults, and the most common etiologies are tension-type and migraine headache.[6] Thus, it is no surprise that headaches are a very common presenting complaint in the UC setting.[7] UC centers are well suited to provide care to patients suffering from

headaches given that most are benign and present unpredictably. Although there is little data available on the utilization of UC for patients with headache, the utilization of ED for headache care is common with headaches accounting for 3.5 million visits annually in the United States.[8,9]

Using a tool or mnemonic to screen for "red flags" that suggest a higher risk for dangerous etiologies of headache may help UC clinicians to minimize the risk of missing rare, serious diagnoses when evaluating headache patients, the vast majority of which will be due to a benign etiology. One such tool is the SNNOOP10 criteria for red flags.[10,11]

SNNOOP10 Criteria:
- **S**ystemic symptoms, including fever
- **N**eoplasm in history
- **N**eurologic deficit or dysfunction
- **O**nset of headache is sudden or abrupt
- **O**lder age (greater than 65 years old)
- **P**attern change or recent onset of headache
- **P**ositional headache
- **P**recipitated by sneezing, coughing, or exercising
- **P**apilledema
- **P**rogressive headache and atypical presentations
- **P**regnancy or puerperium
- **P**ainful eye with autonomic features
- **P**osttraumatic onset of headache
- **P**athology of the immune system
- **P**ainkiller overuse

Patients with one or more "positive" SNNOOP10 criteria generally warrant further evaluation—possibly with neuroimaging, which typically also necessitates ED referral. This patient presented with multiple red flag symptoms for headache, including neurologic deficits, sudden onset of headache, and recent onset/new type of headache, which was precipitated with exertion.[11]

CVT is a rare neurovascular disorder with a wide array of presentations, however, headache is the most common presenting feature[1] and is present in 89% of patients with CVT.[12] Other less common presentations include visual loss, papilledema, diplopia, aphasia, paresis, seizures, ocular chemosis, and cranial nerve palsies, particularly CNIII, IV, and/or VI. In fact, most patients with CVT present with a normal neurologic exam. [1,12]

Thunderclap headache, in particular, is characterized by a high-intensity headache of abrupt onset, according to the International Classification of Headache Disorders 3 (ICHD-3).[13] Abrupt onset likewise is defined as reaching maximum intensity in less than 1 minute.[14]

"There are no routine laboratory tests that can confirm or exclude CVT."

While not the most common presentation, CVT has been associated with a "thunderclap" nature at onset and can also lead to new-onset focal deficits, as was seen with the patient presented.[1,14,15,16] Given the variable nature of CVT clinical presentations, it is common for the diagnosis to be incidentally discovered in an evaluation for other neurovascular conditions, namely SAH. In the International Study on Cerebral Vein and Dural Sinus Thrombosis (ISCVT), the median time from symptom onset to diagnosis was 7 days.[12]

The incidence of CVT is approximately 2 per 100,000 patients and occurs 3 times more frequently in females.[17,18,19,20] Common risk factors for CVT include hereditary thrombophilias (eg, factor V Leiden, protein S deficiency etc.), acquired thrombophilias (eg, pregnancy and the puerperal period), oral contraceptive use, obesity, malignancy, and head injury.[3] In children, the most common risk factors include head and neck infections such as otitis media, mastoiditis, and sinusitis and in older children and connective tissue disorders.[4] Unlike ischemic stroke, CVT is more common in individuals less than 50 years of age.[5] In the (ISCVT), thrombophilia and oral contraceptives were identified as the most common risk factors for CVT.[12] Additionally, in recent years, an association of CVT with both recent COVID-19 infection and/or recent receipt of adenovirus vector SARS-CoV-2 vaccination has been also been identified.[21,22]

Diagnosis

There are no routine laboratory tests that can confirm or exclude CVT. While d-dimer has been explored as a screening test for CVT, a d-dimer level below standard cutoffs used in algorithms for evaluating for VTE (ie, <500 µg/L) has been found to be insufficiently sensitive for clinical use in ruling out CVT, regardless of the pretest probability.[3,23,24]

Imaging with a non-contrast head CT is not suffi-

ciently sensitive to exclude CVT.[25] Therefore, it is recommended to use CT venography or magnetic resonance venography.[1]

Management and Outcomes

CVT is managed typically as an inpatient after initial diagnosis, as patients are at increased risk for elevated intracranial pressure, bleeding, and/or seizures, and benefit from close monitoring of their neurologic status. Patients are typically treated with heparin or other systemic anticoagulation at the time of diagnosis. Anticoagulation is often continued after hospitalization.[1] Mortality associated with CVT ranges from 8-10% and is increased in those who present with coma, hemorrhage, deep cerebral vein thrombosis and in those cases associated with infection or cancer.[26]

Ethics Statement

Despite multiple attempts, the patient could not be contacted for follow-up. Therefore, demographic information and some case details were changed to protect patient confidentiality.

Takeaway Points for Urgent Care Providers

- In addition to cervical artery dissection and intracranial hemorrhage/SAH, CVT should be included in the differential diagnosis for sudden onset or "thunderclap" headache.
- Headache is the most common associated symptom of CVT but is not universally present. Other symptoms of CVT may include seizure and focal neurologic deficits, however, most patients with CVT have an initially normal neurologic exam.
- Risk factors for CVT include female gender, younger age (<50 years), history of venous thromboembolism or thrombophilia, current or recent pregnancy, hormonal contraception, malignancy, recent COVID-19, and active head and neck infections.
- The SNNOOP10 list of red flag symptoms suggestive of higher risk for dangerous causes of headache is a valuable screening tool for UC clinicians to determine which patients with headache warrant ED referral and/or neuroimaging.
- A negative d-dimer is insufficiently sensitive to exclude CVT. The imaging study of choice for evaluating for CVT is either CT or MR venography. ■

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Encouraging Shorter Course Antibiotic Prescribing

Take Home Point: In this quality improvement project, education with performance feedback in combination with clinical decision support (CDS) was effective in modifying clinician behavior surrounding antibiotic prescribing.

Citation: Vernacchio L, Hatoun J, Patane L, et al. Improving Short Course Treatment of Pediatric Infections: A Randomized Quality Improvement Trial. *Pediatrics*.2024;153(2): e2023063691

Relevance: There is increasing evidence that shorter courses of antibiotics for the treatment of pediatric pneumonias (CAP) and skin and soft tissue infections (SSTI) are equally effective to longer courses with fewer side effects. However, clinician prescribing practices often lag behind updates in guidelines.

Study Summary: This was a site-randomized, quality improvement trial within a large pediatric primary care network in Massachusetts. Seventy-five practices were randomly assigned to 1 of 4 intervention groups: quality improvement education and feedback; CDS; both education and feedback plus CDS (combined group); and control (no intervention). There was a 3-month intervention period at the start of the initiative. Pediatric primary care practices in the education and feedback group received an e-mail reminding them of the recommendations and updating them on their performance by e-mail during the 1- and 2-month period of the intervention. Those assigned to the CDS group did not receive any performance feedback or education relative to the project.

The authors found for all cases of CAP and SSTI combined and for each condition individually, the proportion of cases in the control group treated with the recommended short course did not change from the baseline period. In contrast, within all 3 of the intervention groups, there were statistically significant improvements after the intervention period. Education with performance feedback via e-mail and CDS delivered at the point of care were equally effective in changing clinician behavior. The combination of the 2 techniques, however, was more effective than either approach alone. There was an approximately 25% improvement in the groups assigned to education with performance feedback alone or to CDS alone, and there was 42% improvement in the group assigned to the combination of the 2 intervention strategies.

Editor's Comments: There may be limited generalizability of the study to community urgent cares as this was a pediatric primary care group of sites affiliated with an academic children's hospital. The findings do suggest that to change clinicians' behavior a combination of feedback and education methods work better than either alone, and therefore, initiatives developed to influence clinician prescribing are more likely to achieve results if multi-pronged in their approaches. ■

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Can I Trust That Computer ECG Read?

Take Home Point: In this study, a normal or "otherwise normal" ECG machine read excluded a ST elevation myocardial infarction (STEMI).

Citation: Deutsch A, Poroksy K, Westafer L, et. al. Validity of Computer-interpreted "Normal" and "Otherwise Normal" ECG in Emergency Department Triage Patients. *West J Emerg Med*. 2024;25(1)3–8.

Relevance: Chest pain is a common presentation to UC centers. STEMI is the most critical form of acute coronary syndrome (ACS) to identify because immediate revascularization – typically via percutaneous coronary intervention (PCI) – has been shown to improve outcomes.

Study Summary: This was a prospective cohort study of triage ECGs performed in triage according to a standard protocol in an academic emergency department (ED) in the Northeastern United States. Adult patients presenting to the ED with chest pain, chest pressure, chest tightness, weakness, unusual fatigue, palpitations, syncope, dyspnea, or other less typical symptoms for ACS such as nausea and vomiting or pain in the jaw, upper back, or upper abdomen were triaged and had an ECG performed. The ECGs were obtained with a GE MAC 5500 (GE Healthcare, Waukesha, WI) and interpreted using Marquette 12SL (GE Health-

care). Board-certified cardiologists blinded to all aspects of the study reviewed the ECGs and entered the final interpretation into the medical health records. The primary outcome was the number of ECGs with a computerized interpretation of "normal" or "otherwise normal" ECG that were interpreted by cardiologist as STEMI.

Data from 2,275 patients were included in the study. The authors found the most common indication for ECG was chest pain (58% of patients), followed by cardiac arrhythmia (19%). Of patients with ECG machine-interpretations of "normal" or "otherwise normal," 98.6% were discharged from the ED. None of the patients with computer readings of "normal" or "otherwise normal" included in the analysis were found to have a STEMI or a final diagnosis of ACS. Cardiologists agreed with the machine-interpretation of "normal" or "otherwise normal" ECG in 96.7% (n = 2,201) of cases. Of the 3.3% (n = 74) of ECGs where cardiologists did not agree with the machine interpretation, none were interpreted by the cardiologist as STEMI.

Editor's Comments: This study has limited generalizability due to its single site and use of only 1 medical device. The narrow scope of the study to exclude STEMI only should be taken into consideration as there are many other causes for chest pain that were not considered by the authors. Although it is reassuring that the patients had a "normal" or "otherwise normal result," care needs to be taken during any consultation to avoid cognitive bias or premature closure on a benign diagnosis. Nevertheless, this study offers reassurance that, with increasingly sophisticated artificial intelligence and computer algorithm based ECG interpretation, clinicians can feel more confident that "normal" readings make immediately life threatening ACS as a cause for patients' symptoms highly unlikely. ■

Visual Learning Advances Clinical Knowledge

Take Home Point: The combination of procedural and conceptual knowledge improved learning in medical students.

Citation: Beeler N, Ziegler S, Volz A, et. al. The effects of procedural and conceptual knowledge on visual learning. *Adv Health Sci Educ Theory Pract*. 2023 Dec 7. doi: 10.1007/s10459-023-10304-0

Relevance: Learning to interpret visual information is crucial in the provision of care in urgent care (UC) settings, including dermatology and radiology studies. Medical students are often instructed to use algorithms and subsequently provided opportunities to use visual images.

Study Summary: This was a study based in Switzerland where 4th year medical students were recruited to investigate the effects on visual learning of combined procedural and conceptual knowledge (P+C) versus pure procedural knowledge (P) during a dermatology block. The authors used online surveys which allowed them to capture the participants' decisions and their response times. Images from an archive collection were used to design skin-lesion-classification tasks for the learning activities and tests. The study included 2 learning activities: initial knowledge acquisition, in which the learning materials differed between the 2 study groups; and subsequent visual learning, which was similar for both groups.

The authors found that the visual learning resource was necessary to reach significant performance improvements in track tasks. This implies that additional conceptual knowledge about algorithms for medical image interpretation might support error correction mechanisms in visual classification tasks.

Editor's Comments: This study focused on novice learners (eg, medical students) and may not be generally applicable to practicing clinicians. Regardless, it does highlight the importance of visual aspects of learning, especially for inherently visual aspects of clinical practice. ■

Non-Operative Cross Bracing Protocol for Anterior Cruciate Ligament Ruptures

Take Home Point: Anterior cruciate ligament (ACL) ruptures were found to heal with a novel bracing protocol after 3 months without surgical repair.

Citation: Filbay S, Dowsett M, Jomaa M, et. al. Healing of acute anterior cruciate ligament rupture on MRI and outcomes following non-surgical management with the Cross Bracing Protoco. *Br J Sports Med*. 2023 Dec;57(23):1490-1497. doi: 10.1136/bjsports-2023-106931

Relevance: The present management strategy for ACL ruptures centers around surgical repair, however, surgery may not be an option for many patients and non-surgical treatments which could yield similar outcomes would be highly valuable.

Study Summary: This was a case series where the authors recruited and treated 80 consecutive participants, aged between 10-58 years old, who presented to a private sport

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and exercise medicine practice in Sydney, Australia. All patients had magnetic resonance imaging (MRI) confirmed acute ACL ruptures and subsequently were treated non-operatively with the cross-brace protocol (CBP). The CBP aims to reduce the gap distance between the ligament remnants by immobilizing the knee at 90° of flexion for 4 weeks after acute ACL rupture in attempt to facilitate bridging of tissue and healing between the ruptured ACL remnants. Following this initial period, participants then underwent a range of motion knee movements at weekly increments and physical therapy-led rehabilitation targeting lower limb neuromuscular control, muscle strengthening and power, and functional training.

The authors noted that at the 3-month follow-up, 90% (n=72) of the participants had healing of the ACL such that it was continuous again. 40 participants had an MRI grade that suggested better 12-month knee function and quality of life, reduced passive knee laxity and a higher rate of return-to-sport. Among participants, 11 subsequently suffered a re-rupture of the ACL.

Editor's Comments: This was a case series and not a research study so there was no comparison between the CBP, surgical repair, or no treatment. The CBP is a long protocol and may not be feasible in all regions. Furthermore, after the 50th recruited patient, patients were discouraged from undertaking the CBP if they had a femoral avulsion and/or ACL tissue displaced outside the boundaries of the intercondylar notch, implying a change in protocol during the course of the case series. Further research with a comparator group to the CBP would be helpful in determining if this may be a viable or even preferable alternative to surgical repair and, if so, in which patient groups. ■

Opioid Exposure and Risk of Spontaneous Preterm Delivery

Take Home Point: In this case-controlled study, an association was found between total opioids prescribed and the odds of spontaneous preterm birth.

Citation: Bosworth O, Padilla-Azain M, Adgent M, et. al. Prescription Opioid Exposure During Pregnancy and Risk of Spontaneous Preterm Delivery. *JAMA Network Open*. 2024;7(2): e2355990. doi:10.1001/jamanetworkopen.2023.55990

Relevance: Pregnant patients with severe pain not controlled with acetaminophen are left with little pharmaceutical options beyond opioids. The impact of short prescription opioid exposure for acute episodes of pain on perinatal outcomes is not well characterized.

Study Summary: This was a nested case-control study of a retrospective cohort of pregnant patients enrolled in Tennessee Medicaid (TennCare), which provides insurance coverage to 50% of the state's pregnant patients. Records of TennCare enrollment files were linked to health care encounters, hospital discharge data, and opioid prescription fills. Tennessee birth certificate data that provide information on clinical estimates of gestational age, maternal demographics, clinical characteristics, and obstetric procedures were also reviewed and linked with opioid prescription fills using national drug codes. Births between 24 weeks 0 days and 36 weeks 6 days were considered spontaneous if there were premature rupture of membranes, prolonged or precipitous labor, a use or attempted use of forceps or a vacuum, and no induction for delivery.

The authors identified 25,391 cases of spontaneous preterm birth. They found opioid morphine milligram equivalents (MME) prescribed in the 60 days prior to the index date were significantly associated with higher odds of spontaneous preterm birth. Doubling of opioid MME was associated with a 4% increase in the odds for spontaneous preterm birth compared with no opioid exposure (adjusted odds ratio [OR], 1.04; 95% confidence interval [CI], 1.01-1.08). In the study, 1,573 pregnancies had filled prescriptions for 900 MMEs or greater prescriptions, which were associated with 21% increased odds for spontaneous preterm birth compared with no opioid exposure.

Editor's Comments: The dispensing data of the study assumed a proxy use, which may lead to potential bias as the amount of opioids actually consumed is unclear from this data. Opioid prescribing suggests patients are dealing with severe pain, which may have contributed to the preterm delivery as could the underlying condition causing pain. Since causality cannot be proven from these data, caution in over-interpretation is advisable. However, the results of this study do support recommendations for restricting opioid use in pregnancy to the minimal reasonable amount as most opioids are known to cross the placenta and cause additional perinatal issues for infants beyond prematurity. ■

Online Sessions Improve Long COVID Recovery

Take Home Point: In this study, online, home-based, supervised, group physical and mental therapy was clinically

effective in improving health-related quality of life compared with usual care at 3 and 12 months.

Citation: McGregor G, Sandhu H, Bruce J, et. al. Clinical effectiveness of an online supervised group physical and mental health rehabilitation programme for adults with post-COVID-19 condition (REGAIN study): multicentre, randomised controlled trial. *BMJ* 2024;384: e076506. doi: 10.1136/bmj-2023-076506

Relevance: Long COVID continues to affect a multitude of patients and identifying appropriate therapies that will improve their quality of life remains an important target for relieving disability and allowing those afflicted to resume normal daily activities.

Study Summary: This was a pragmatic, multicenter, parallel group, superiority randomized controlled trial conducted on patients throughout England and Wales. Participants were adults who had been discharged from the hospital ≥3 months previous to a hospital admission with COVID-19 and who had ongoing substantial COVID-19 related physical and/or mental health sequelae. They were randomly allocated to an intervention or usual care (control) group. Participants in the control group received best practice usual care, consisting of a 30-minute, online, one-to-one consultation with a trained practitioner. The intervention participants received an 8 week, online, home based, supervised, group rehabilitation program, supported by a workbook. The intervention group received weekly practitioner-led live online group exercise sessions and 6 live online group psychological support sessions delivered through Zoom.

The authors randomized 585 participants for the study. They found at 3-months, health-related quality of life improved more for participants in the intervention group (mean PROPr score 0.27 [SD 0.18]; n=237) than the control group (0.23 [SD 0.18]; n=248). By 12 months, all scores and scales were further improved in the intervention group. However, the investigators observed improvements in overall quality-of-life and in other indices of wellbeing with both the intervention and control groups.

Editor's Comments: Importantly, patients in both groups improved over the course of 12 months, adding additional evidence to support that the natural history of long-COVID is recovery, albeit at a frustratingly slow pace for some. It was not possible to blind participants to which arm of the study they were randomized. It is likely that the intervention group experienced a placebo effect to some extent given the higher degree of support they received than controls. ■

What Does Unclaimed Property Mean for Urgent Care Providers?

Urgent Message: Undeliverable refunds of patient balances do not become property of the urgent care center, but rather, after reasonable effort to contact patients, must be turned over to the state.

Alan A. Ayers, MBA, MAcc

Citation: Ayers A. What Does Unclaimed Property Mean for Urgent Care Providers? *J Urgent Care Med.* 2024; 18(8):29-31

Urgent care centers frequently carry patient balances due to overpayment. This happens with co-pays, co-insurance, deductibles, or other out-of-pocket outlays when the insurance payment is more than was anticipated. While the urgent care should issue a refund in these situations, sometimes refund checks mailed to patients are returned or are never cashed. This article will examine the obligations of urgent care operators as to how to manage these funds.

What is Unclaimed Property?

Unclaimed property is generally defined as any financial asset left inactive by its owner for a period of time, typically three years in most states.[1] For example, the North Carolina Unclaimed Property Act defines "property" as:

> *money or tangible personal property held by a holder that is physically located in a safe deposit box or other safekeeping depository held by a financial institution within this State or a fixed and certain interest in intangible property or money that is held, issued, or owed in the course of a holder's business, or by a government, governmental subdivision, agency, or instrumentality, and all income or increments therefrom.*[2]

It is property the business has in its possession that hasn't been claimed by the true owner. Under the Revised Uniform Unclaimed Property Act—the model law upon which many states design their statutes—the term "owner" means "a person that has a legal, beneficial, or equitable interest in property or the person's legal representative when acting on behalf of the owner, and includes (i) a depositor, for a deposit; (ii) a beneficiary, for a trust other than a deposit in trust; (iii) a creditor, claimant, or payee, for other property; and (iv) the lawful bearer of a record that may be used to obtain money, a reward, or a thing of value."[3] Examples of unclaimed property include patient credit balances, uncashed pay-

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roll checks, uncashed vendor checks, unidentified remittances, self-insurance payments, and uncashed debt/interest checks.[4]

These unclaimed items can remain on an urgent care's books for a significant period of time as old credit balances or outstanding checks on bank reconciliations. In some instances, bookkeepers are inclined to "clean up" their financials and reverse these items as income. However, this practice is illegal.

In the healthcare industry, funds that are subject to the state's unclaimed property laws can emerge in a variety of ways.[5] In addition to the standard accounts payable scenario, complicated reimbursements can give rise to unique and substantial liability for unclaimed property. This may be in the form of credit balances from insurance overpayments when an urgent care patient pays out of pocket for an amount also paid by the insurance company, or where more than one insurer pays the insured's claim.[6] In these circumstances, it may be challenging to reconcile the company's accounts. As a result, it's not uncommon for urgent cares to rack up significant credit balances that will one day become unclaimed property.

What Should an Urgent Care Do with Unclaimed Property?

California defines a holder of unclaimed property as a person or trustee in possession of property subject to the Unclaimed Property Law "belonging to another, or who is trustee in case of a trust, or is indebted to another on an obligation subject to the [Unclaimed Property Law]."[7] The holder is required to report the unclaimed property in its possession by a deadline and to deliver it to the state.[8] If the holder fails to deliver the property to the state as required, it is subject to a fine if the failure is willful[9] or subject to interest at the rate of 12% a year if the failure is not.[10] The state government acts as a custodian and holds the property until it is delivered to the rightful owner. The intent of unclaimed property laws is to make certain that the property is preserved for, and returned to, its rightful owner.[11]

Thus, urgent cares have a legal obligation to properly hold and remit unclaimed property to the state after a certain period of time. They should understand that these laws govern the disposition of unclaimed property, which eventually can become property of the state—typically known as "escheatment."[12]

After the dormancy or waiting period has passed, the holder must conduct due diligence and try to locate the owner of the property prior to escheatment. The laws say the holder is generally required to:

- Confirm the owner's interest in property that satisfies state thresholds by sending the owner notice via a due diligence letter or email.[12]
- If the owner fails to respond to the notice, the holder must escheat the property to the state.[12,13]

"Urgent cares have a legal obligation to properly hold and remit unclaimed property to the state."

Unclaimed Property Audits

To ensure compliance with these laws, states conduct unclaimed property audits, which are usually handled by the secretary of state and/or the state attorney general. In most states, third-party auditors conduct these audits.

There are a number of situations that can cause an urgent care to be the target of an unclaimed property audit. A few of the most common include:

- A lack of reporting history;
- Inconsistent reporting history;
- Fluctuations in amounts or types of property being reported; or
- Not reporting property types common to an industry.[12]

These audits can impose a significant burden on an urgent care business because of the time and resources involved. If unclaimed property reports aren't filed, an urgent care may be penalized with interest. Note that there is no statute of limitations for delinquent filers, and some states are allowed to audit retrospectively going back to the day the business was formed.[4,14]

If an urgent care business has never filed an unclaimed property report with the state but has held unclaimed property in the past, it is strongly recommended that it file a voluntary disclosure agreement (VDA). This provides an urgent care with several benefits, like a limited period of prior-year returns to file, the waiver of interest and/or penalties, and limitations on future audits.[14]

Incidentally, once the property has been delivered to the state, there is a process for an individual to make a claim. For example, Pennsylvania Statute § 1301.21 of the Unclaimed Property Law provides the procedure for aggrieved persons regarding abandoned or unclaimed property paid or delivered to the Commonwealth:

Any person aggrieved by a decision of the State Treasurer, or as to whose claim the State Treasurer has failed to act within ninety (90) days after the filing of the claim, may commence an action in the Commonwealth Court to establish his claim. The proceeding shall be brought within thirty (30) days after the decision of the State Treasurer or within one hundred twenty (120) days from the filing of the claim if the State Treasurer fails to act.[15]

Takeaway Points

- It is critical for urgent care owners and operators to understand their state's unclaimed property laws, such as how the urgent care's processes can be organized and structured to avoid accruing unclaimed property altogether.
- One way to do this is to create payer agreements and overpayment letters that state that unclaimed funds will revert back to the provider.
- For credit balances that are already due and outstanding, a careful read of the applicable law may show that an escheat exemption is available.
- Since each state has unique laws in this area, consult with legal counsel for further analysis.[11] ■

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6. See generally, Miranda Helfrich, *Unclaimed Property Accounting for Healthcare Practices*, Adams Brown (May 19, 2022). Retrieved at https://www.adamsbrowncpa.com/blog/unclaimed-property-accounting-for-healthcare-practices/.
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9. California Code Civil Procedure § 1576. See *Taylor v. Western States Land & Mortg. Co.*, 77 Cal. App. 2d 869, 176 P.2d 975 (Cal. App. 1947).
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CME: This article is offered for AMA PRA Category 1 Credit.™
See CME Quiz Questions on page 11.

Urgent Care Evaluation and Management of Boxer's Fractures

Urgent Message: Boxer's fractures are among the most common hand fractures and should be suspected in cases of closed fist injury. Additionally, a laceration that accompanies a boxer's fracture may represent a fight bite, which should be treated to reduce the risk of infection.

Jennifer Hicks, DO; Bradley Strauch, MD

Citation: Hicks J, Strauch WB. Urgent Care Evaluation and Management of Boxer's Fractures. *J Urgent Care Med.* 2024; 18(8):32-36

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

Questions for the Clinician at the Bedside

1. What mechanisms are most likely to cause a boxer's fracture?
2. Which fractures need immediate reduction and which can be simply immobilized without manipulation?
3. Which other injuries should urgent care clinicians consider in patients with suspected boxer's fracture?
4. What are the "red flags" clinicians should evaluate for in patients with closed fist injury?
5. How is a "fight bite" managed differently than a closed boxer's fracture?

Clinical Scenario

An 18-year-old male presents with pain in the ulnar aspect of his right hand after he punched a wall 2 hours earlier. He has increased pain with motion, a minimal amount of numbness in the pinky finger, and notes immediate swelling over his knuckles. He denies pain in the wrist and elbow or any other acute complaints.

On exam, he is minimally tachycardic, but his vitals are otherwise normal. He is alert and in no distress, holding his hand in his lap. There is obvious swelling to the dorsal and ulnar aspects of the hand and moderate tenderness to palpation over the metacarpal phalangeal (MCP) joint of the little/pinky finger. There is increased pain with active hand movements, and his range of motion is significantly reduced at the MCP joint of the little finger. There is no tenderness over the proximal interphalangeal (PIP) or distal interphalangeal (DIP) joints of the little finger or over the MCP of the ring finger. The proximal hand, wrist, and elbow are non-tender with normal range of motion. Distal capillary refill of all fingers is brisk, and the patient has sensation to all fingers.

An x-ray of the right hand is obtained, demonstrating a fracture of the 5th metacarpal neck with approximate 30 degrees of angulation deformity (**Image 1**).

Relevant Anatomy

The index, middle, ring, and little fingers each have 3 phalanges: the proximal, middle, and distal phalanx (**Image 2**).

Boxer's Fracture

A "boxer's fracture" is one of the most common hand injuries. It most often occurs in younger patients who strike a hard surface—such as a wall or another's face—with a closed fist. A boxer's fracture is a fracture of the

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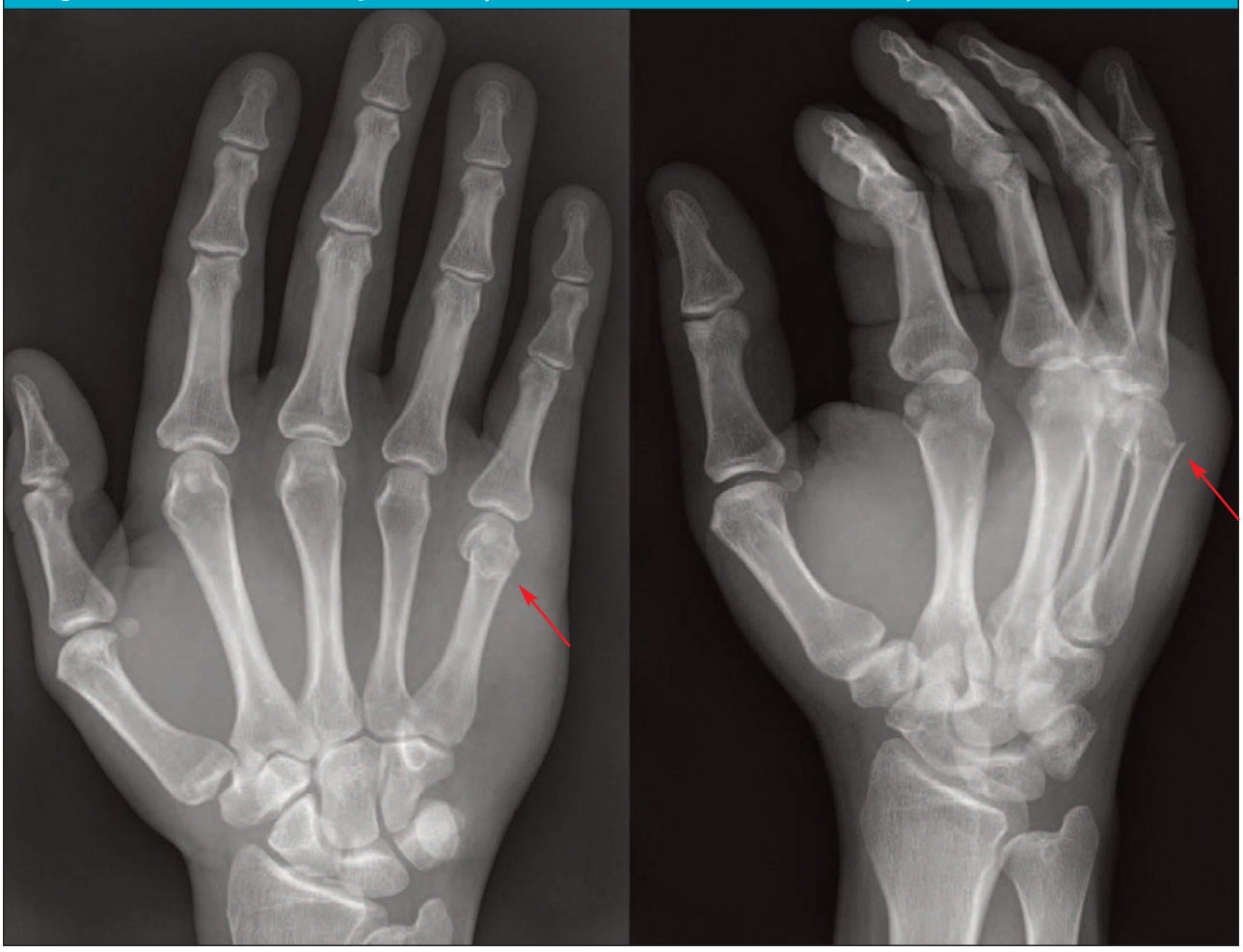
Image 1. Boxer's Fracture at the 5th Metacarpal Neck (Anterior to Posterior and Oblique Views)



5th metacarpal neck (little finger). The degree of angulation is measured on the oblique and/or lateral view, which determines if reduction is necessary.[1] Another sign that reduction should be performed is pseudo-clawing. Pseudo-clawing is hyperextension of the MCP and flexion of the PIP with attempted extension of the injured hand.[1] A carpal-metacarpal (CMC) dislocation can also occur with more forceful mechanisms.

Any closed fist injury (CFI) that results in a fracture with a laceration should be treated as an open fracture, which will significantly affect management and can result in serious infectious complications.[2]

History

The most typical mechanism of injury involves a CFI where the 5th MCP (little finger) strikes the hard surface. It is important to assess whether there was a possibility of CFI to the mouth (ie, a "fight bite") as the risk of forceful contamination with oral flora dramatically increases risk for infection. Infections can range from superficial skin infection to something more serious, such as tenosynovitis or a septic joint. Infection occurs in a significant percentage of closed fist injuries. Additionally, "fight bites" raise concern for the possibility of retained tooth fragments or other macroscopic debris that may further increase infection risk. Consider imaging if this is a consideration.[3]

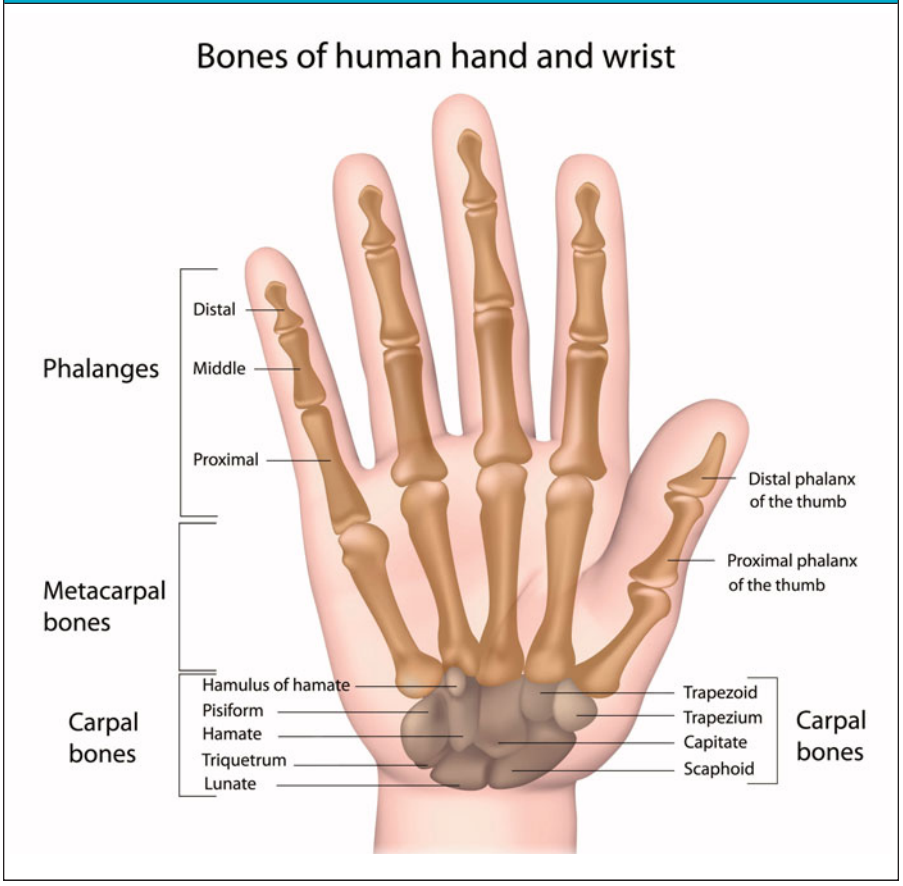
The pain associated with boxer's fractures is usually most significant at the fracture site near the 5th MCP joint. Pain is exacerbated with movement, and range of motion is usually reduced. Associated symptoms may include swelling, paresthesias, and bleeding. Pain present at the proximal joints (ie, wrist and elbow) or distal joints (ie, PIP, DIP) should be explored further to determine if additional radiography exams would be required.

Physical examination

Exam should focus on evaluation of swelling, areas of tenderness, and most importantly, defects in the skin. Palpating the area of greatest pain as well as the extremity to the joint proximal and distal to the injury (ie, distal finger to the elbow) is helpful for excluding other associated injuries. It is important to assess range of motion, flexor and extensor tendon function, and neurovascular status by documenting sensation, capillary refill, and pulses.

Rotational deformity can be assessed by having the patient flex their digits onto the palm. Extending a line out from each of the fingers, the lines should converge near the scaphoid navicular.[4] Convergence of these lines indicates normal rotation, while divergence of the little finger indicates rotational dysfunction. Another way to assess this is to have the patient flex the MCP to 90 degrees while extending the PIP and DIP. If rotational alignment is normal, the fingers should be in a straight line in this position. It is helpful to compare any rotation to the opposite hand as some individuals have some natural rotation of the little finger.[5]

Image 2. Bones of Human Hand and Wrist



Radiography

A stepwise approach to evaluation of a hand x-ray (XR) will avoid missing important findings. Assess the metacarpal bones looking for alignment, signs of soft tissue swelling (indicating location of greatest injury), and fracture. Fractures will appear as a break in the cortex on any of the 3 views, disruption in trabeculations, lucency within the bone, and/or angulation or impaction. Evaluate the bones of the wrist (carpal bones) for fractures—specifically looking at the hamate bone with a boxer's fracture—or dislocation. Obtain a dedicated wrist x-ray if wrist palpation or range of motion elicit pain.

"Evaluate the bones of the wrist (carpal bones) for fractures—specifically looking at the hamate bone with a boxer's fracture—or dislocation."

Management

First, it must be determined if reduction is necessary. If there is 30-50 degrees or less of angulation of the 5th metacarpal, this is acceptable, and the injury does not require reduction for a functional outcome.[6] With higher degrees of angulation, reduction can be offered to help minimize the resultant cosmetic deformity.[7] If there is significant angulation, sometimes a modified lateral view can be obtained to help make a decision regarding reduction. Note that a rotational deformity will often not be corrected with closed reduction. If there is no need for reduction, splinting with an ulnar

gutter splint to the immobilize the joint proximal and the joint distal to the injury is usually appropriate.

In recent years, increasing evidence has emerged suggesting functional wrapping or buddy taping may be acceptable alternatives to rigid splint immobilization.[8,9] However, as this has yet to meet universal acceptance, it is prudent to continue fully immobilizing the fracture as described above unless real-time consultation with a hand specialist is possible. Caution the patient that some degree of cosmetic deformity can occur. After splinting, discuss splint maintenance, analgesia, and the role of ice and elevation. Patients should be referred to an orthopedist or hand surgeon as soon as possible, but ideally within 1 week.

"Patients with a boxer's fracture (or any other hand fracture) and with an overlying fight bite should be treated as having an open fracture and therefore immediately referred to a local emergency department with orthopedics coverage for possible surgical debridement and intravenous antibiotics."

Closed reduction has fallen out of favor in the last decade in favor of surgical repair when indicated. Surgical repair is increasingly reserved for open or intraarticular fractures or cases where significant functional impairment is expected.[10]

A fracture resulting from a CFI involving a mouth requires special treatment as oral organisms may be introduced resulting in septic arthritis, tenosynovitis, or osteomyelitis. These CFI, colloquially referred to as "fight bites," have disproportionately higher associated morbidity compared with other CFI. Additionally, patients may be reluctant to reveal the etiology of the injury for fear of legal or other social issues. Fight bites often present with a laceration over the MCP joint of the middle, ring finger, or little finger. Subsequent infection can track along the subfascial and subcutaneous spaces on the dorsum of the hand.[11] Joint penetration occurs in over 90% of cases, and septic arthritis occurs in 12% of cases.[12] The incidence of osteomyelitis and tenosynovitis are reported to be 15-25%.[13] Fight bite infections are usually polymicrobial. Talan et al. showed that the median number of isolates per wound culture was 4, with common organisms being *streptococcus, staphylococcus, eikenella corrodens,* and *fusobacterium*.[14]

Patients with a boxer's fracture (or any other hand fracture) and with an overlying fight bite should be treated as having an open fracture and therefore immediately referred to a local emergency department (ED) with orthopedics coverage for possible surgical debridement and intravenous antibiotics. Instruct patients not to eat or drink before referring them as there is a high probability urgent intervention in the operating room may be recommended. For patients with fight bites without associated fracture, aggressive wound care with copious irrigation in urgent care (UC) is critical. The recommended first-line antibiotic after fight bite injuries is amoxicillin/clavulanate. In patients with true penicillin allergy, doxycycline, ciprofloxacin, or trimethoprim/sulfamethoxizole in combination with metronidazole or clindamycin is recommended.[15] In addition to antibiotic prophylaxis, ensure that the patient's tetanus vaccination status is up-to-date.

Next-Level Urgent Care Pearls

- Experienced providers can accomplish closed reduction of boxer's fractures in urgent care. If provider training and comfort allows, consider utilizing a hematoma block to allow for better patient comfort when applying pressure and traction. Ensure the neurovascular status of the hand is intact before and after the procedure. Obtain post-reduction x-rays to evaluate for the quality of the reduction. Place the hand in an ulnar gutter splint and refer the patient for follow-up with orthopedics or hand surgery as described above after confirming improved alignment.[8] For injuries not requiring reduction, ulnar gutter splints remain the most prudent initial immobilization measure. However, there is growing controversy about this (as stated above) with some recent studies showing non-rigid splint or buddy taping for initial immobilization resulting in comparable outcomes.[8,9]
- Exploration for other mechanisms of injury or social concerns include:
  - *Fight bite* – Specifically ask if the injury occurred by contact with teeth. This will change management and require antibiotic prophylaxis.
  - *Domestic abuse* – If a patient situation is concerning for intimate partner violence, inquire about the safety of the patient's living situation and offer community resources for domestic abuse support/counseling.
  - *Altercation* – If the injury occurred because of an altercation, consider other injuries the patient may be

"Many patients with CFI may not be forthcoming about the circumstances of the injury."

unwilling to report, including head or neck injury.

- Remember to ensure the patient history makes sense. Many patients with CFI may not be forthcoming about the circumstances of the injury due to the sensitive nature of certain injuries, including:
  - Injuries from child or domestic abuse
  - Injuries from alternative sexual practices
  - Illegal drug use or interpersonal violence
  - Nonconsensual sexual relations
  - Injuries with potential legal ramifications

Clinical Scenario Conclusion

An XR showed a fracture of the 5th metacarpal neck, consistent with a boxer's fracture. There was 30 degrees of angulation, not requiring a reduction. The patient was splinted in an ulnar gutter fiberglass splint and asked to follow up with orthopedics within 3-5 days. The patient followed up as instructed, and the splint was changed to a cast. The patient was immobilized for 4 weeks, and the cast was removed with a good functional outcome.

Takeaway Points

- Boxer's fractures are among the most common hand fractures and should be suspected in cases of closed fist injury.
- If the angulation of the 5th metacarpal neck is 30-50 degrees or less, reduction is not necessary.
- Specifically evaluate for the rare, but serious possibility of a carpal-metacarpal dislocation.
- A laceration which accompanies a boxer's fracture may represent a fight bite and should be treated as an open fracture. These injuries warrant immediate evaluation in an ED with orthopedics specialty coverage.
- CFI without associated fracture can be irrigated extensively and treated with oral outpatient antibiotics, but ensure close follow-up and strict ED precautions given the high rates of serious associated infection.
- Surgical repair of 5th metacarpal fractures is controversial and is becoming increasingly reserved for more complicated fractures. However, given that boxer's fractures are usually dominant hand injuries, orthopedics follow-up as soon as possible, ideally within 1 week, is prudent to ensure that alignment is appropriate, and closed reduction is not indicated. ■

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Original Research

Influence of Clinical Setting on Antibiotic Prescribing Practices for Acute Otitis Media in Children at an Urban Academic Medical Center

Urgent Message: This retrospective chart review study found that the odds of children receiving an antibiotic prescription for acute otitis media in urgent care and the emergency department were significantly higher compared to a primary care setting. Further research is needed to better understand factors contributing to higher antibiotic prescribing rates in acute care settings.

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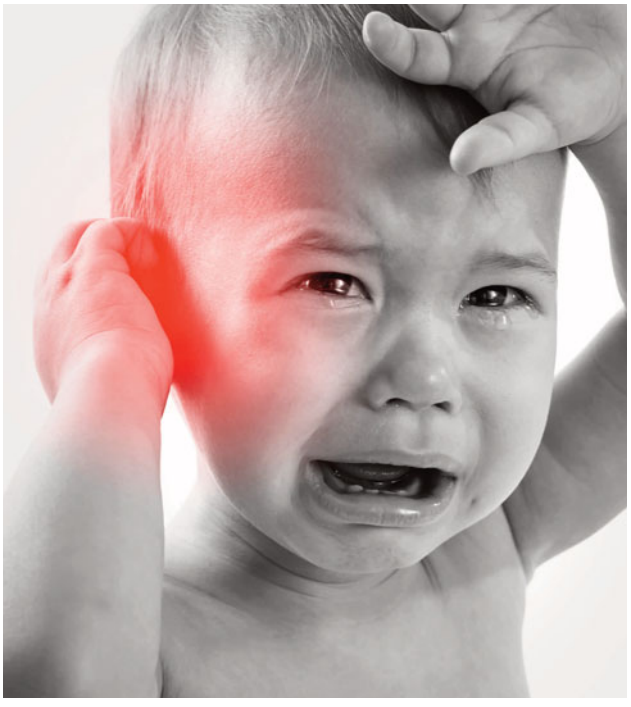

Abstract

Introduction: Acute otitis media (AOM) in children is a common cause of primary care and unscheduled visits and results in many antibiotic prescriptions. In most instances, the American Academy of Pediatrics' (AAP) recommendations focus on "watchful waiting" with close follow-up. The AAP guidelines for the treatment of uncomplicated AOM only recommend initiation of antibiotic therapy in cases when there is no improvement within 48-72 hours. The purpose of this study was to investigate clinician prescribing practices at an urban academic hospital in accordance with the AAP guidelines in pediatric patients with uncomplicated AOM.

Methods: A retrospective, cross-sectional analysis of de-

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Table 1. ICD-10 Codes With Corresponding Otitis Media Diagnoses

ICD-10 codes	Diagnosis
H65.199	Other acute nonsuppurative otitis media, unspecified ear
H66.90	Otitis media, unspecified, unspecified ear
H66.91	Otitis media, unspecified, right ear
H66.92	Otitis media, unspecified, left ear
H66.93	Otitis media, unspecified, bilateral

identified patient data was performed involving pediatric visits at the University of Illinois Hospital & Health Sciences System from January 2016 to May 2020. The primary outcome was treatment with an oral antibiotic for AOM. The secondary outcome was guideline concordance of antibiotic prescriptions. Descriptive statistics and chi-square analyses were performed. Logistic regression was used to predict antibiotic treatment and guideline adherence.

Results: In the study, 792 patients met the inclusion criteria, and 85.7% received an oral antibiotic. Patients seen at an acute care facility—urgent care (UC) or the emergency department (ED)—were more likely to receive antibiotics compared to those seen in primary care clinics (64.7% vs. 33.0%, p<0.0001). The odds of receiving an antibiotic in an ED or UC setting were over 10 times greater than in a primary care clinic (OR 10.91 95% CI 5.67 to 20.98). If an antibiotic was prescribed, prescribing guidelines were followed 97.2% of the time. Deviations from antibiotic prescribing guidelines most commonly involved the use of macrolides.

Conclusion: Patients with AOM were more likely to receive antibiotic prescriptions in ED and UC settings compared to the primary care setting. When antibiotics are given, the appropriate first-line medications were prescribed the majority of the time.

Introduction

AOM is among the most common reasons for pediatric primary care visits in the United States. Approximately 80% of all children will have at least one episode of AOM in their lifetime, and one-third of children will have >5 episodes by the age of 7. AOM is most prevalent between 6 to 12 months of age, and the incidence declines after age 5 years.[1]

Most cases of AOM occur in the setting of viral respiratory infections and, in otherwise healthy children, will resolve without treatment. However, despite recommendations for delaying antibiotics in lower risk situations (eg, older children, unilateral symptoms, absence of fever) AOM remains among the most common indications for systemic antibiotic prescriptions in children.[1,2]

The American Academy of Pediatrics (AAP) recommends that mild to moderate AOM in patients older than 24 months be managed with either observation with close follow-up or oral antibiotic therapy based on shared decision-making with the patient's parents/caregiver. Symptoms that categorize severe AOM include moderate or severe otalgia, otalgia for at least 48 hours, or a temperature of 39°C or higher.[3] If antibiotics are clinically indicated, high-dose amoxicillin is the recommended initial treatment unless there is a known allergy. Cephalosporins are preferred and considered safe even if the patient is truly allergic to penicillin, and amoxicillin-clavulanate should be reserved for cases when the patient has taken amoxicillin in the past 30 days or has accompanying conjunctivitis.[4]

Adherence to guidelines among clinicians has remained imperfect, and the most recent evidence suggests that high rates of non-first-line antibiotic prescribing persists.[5] The likelihood of adherence to antibiotic guidelines has also been shown to vary based on clinician specialty, age of the child, location of care, and time of the visit.[6] Accurate diagnosis and appropriate treatment, specifically decreasing the use of immediate antibiotics to treat mild-moderate AOM, has important implications for antibiotic resistance.[7] Few studies have investigated antibiotic prescribing practices in an ethnically diverse and low-income population. The objective of this study was to investigate clinician prescribing practices in a large, urban academic hospital system in accordance with the AAP clinical practice guidelines (CPG).

Methods

Ethical Considerations

The University of Illinois at Chicago Institutional Review Board approved the study protocol (#2019-1192). The content is solely the responsibility of the authors and does not necessarily represent the official views of the Center for Clinical and Translation Science (CCTS).

Study Design

This study was a retrospective analysis of an administrative dataset. Data for this study was extracted with the support of the CCTS using the Clinical Research Data Warehouse (CRDW) and the University of Illinois at Chicago Clinical Information Repository for Cohort Learning

and Exploration (UIC CIRCLE) as the data source. The CRDW is a de-identified data store of 3.4 billion electronic health records, including 260 million clinical events and 6.2 million visit encounters within the University of Illinois Hospital & Health Sciences System (UI Health). The database includes information regarding the clinician, medications, billing codes, procedures, patient demographics, vital signs, labs, and diagnoses associated with various encounters at any of the UI health subsites. UI Health is a part of the University of Illinois at Chicago (UIC), which includes a 462-bed tertiary care hospital, 26 outpatient clinics, and 14 primary care facilities throughout the city of Chicago.

Patient Population

The study population consisted of all pediatric patients in the CRDW with the International Classification of Diseases-10 (ICD-10) codes for AOM assigned during an initial visit and subsequent ambulatory encounter within UI Health from January 1, 2016 – May 20, 2020. We restricted our analysis to 1,000 consecutive charts, which were collected by CCTS sequentially and blinded to the authors. Cases were not selected preferentially based on the location of treatment. (**Table 1**). Inclusion criteria consisted of patients aged 2 to 12 years with the corresponding ICD-10 codes during an initial visit during this time frame. The age range was chosen in correlation to the AAP guideline for non-severe AOM for older children (>24 months). Exclusion criteria included the following: patients older than 12 years of age, follow-up visits related to AOM, as well as inpatient admission or admission for surgical procedures (eg, tympanostomy tubes).

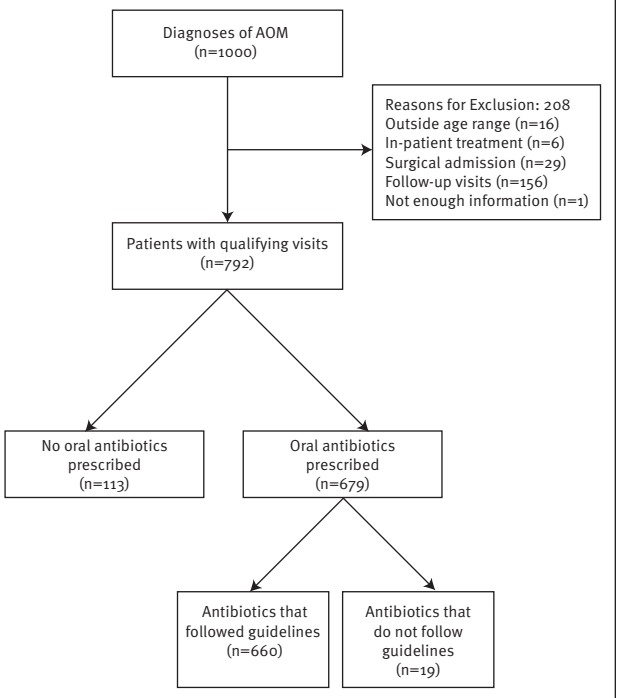
Medications prescribed at each encounter, location of the visit, clinician degrees (Doctor of Medicine [MD], Doctor of Osteopathic Medicine [DO], Advanced Practice Registered Nurse [APRN], which is similar to Nurse Practitioner [NP], and Physician Assistant [PA]), and demographic information of the patient including age, sex, race, and zip code were obtained from the CRDW.

Independent and Outcome Variables

The primary outcome was the proportion of patients who were treated with an oral antibiotic following a diagnosis of AOM. If a patient was not prescribed any antibiotics, then "watchful waiting" was assumed. Medications prescribed at the time of the encounter were collected and analyzed.

The secondary outcome was the proportion of patients who were treated with an oral antibiotic that followed the AAP CPGs if a prescription was provided.

Figure 1. Inclusion Criteria Flowchart



Statistical Analysis

Percentages were calculated for categorical variables (eg, sex, race, location of visit, prescribing clinical credentials). Chi-square was performed to analyze percent differences between patients who received antibiotics versus no antibiotics. Univariate and multivariate logistic regression (age, sex, location, prescribing clinician, race) models were used to predict treatment with oral antibiotics versus no antibiotics. Patients aged 2-6, male sex, MD/DO, and primary care facilities were used for reference categories. A p-value of less than 0.05 was considered statistically significant. Statistical analyses were performed using MedCalc for Windows, version 19.4 (MedCalc Software, Ostend, Belgium).

Results

Demographics

Of the 1,000 patient encounters that were extracted from the database, a total of 792 patients met inclusion criteria (**Figure 1**). The patient population consisted of a majority of children between the ages of 2 and 6 (66.9%), with 53.0% being male. A range of racial groups were represented including Hispanic (38.4%), African American (38.0%), White (9.6%), and Other (14.0%). Many patients were treated at a UC facility (42.0%),

Table 2. Demographics of Patients Diagnosed With Acute Otitis Media by Oral Antibiotic Status

Variable	No oral antibiotic given % (n)	Oral antibiotic given % (n)	Total % (n)	p-value[a]
Total	14.3 (113)	85.7 (679)	792	
Age				
2-6	61.1 (69)	67.9 (461)	66.9 (530)	0.15
7-12	38.9 (44)	32.1 (218)	33.1 (262)	
Sex				
Male	62.8 (71)	51.4 (349)	53.0 (420)	**0.02**
Female	37.2 (42)	48.6 (330)	47.0 (372)	
Race/Ethnicity				
Black or African American	40.7 (46)	37.6 (255)	38.0 (301)	0.41
Hispanic	31.9 (36)	39.5 (268)	38.4 (304)	
White	12.4 (14)	9.1 (62)	9.6 (76)	
Other	15.0 (17)	13.8 (94)	14.0 (111)	
Location of Visit				
PCP	63.7 (72)	33.0 (224)	37.4 (296)	**<0.0001**
ENT	24.8 (28)	2.1 (14)	5.3 (42)	
ED	7.1 (8)	16.2 (110)	14.9 (118)	
Urgent Care	3.5 (4)	48.5 (329)	42.0 (333)	
Specialty	0.9 (1)	0.3 (2)	0.4 (3)	
Prescribing Clinician				
MD	78.8 (89)	54.9 (373)	58.3 (462)	**<0.0001**
APRN	18.6 (21)	35.8 (243)	33.3 (264)	
DO	1.8 (2)	1.9 (13)	1.9 (15)	
PA	0	7.4 (50)	6.3 (50)	
Other	0.9 (1)	0	0.1 (1)	

[a]Bolded values with p<0.05 significant

primary care facility (37.4%), and ED (14.9%), with a small percentage of patients at the otolaryngology clinic (5.3%) and at a specialty clinic (0.4%) Most patients were evaluated by an MD (58.3%) or an APRN (33.3%).

Primary Outcome (Treatment With Oral Antibiotics)

Of the 792 patients who presented with AOM and met criteria, 85.7% received an oral antibiotic. There were no differences between oral antibiotic prescriptions between children based on age and race (**Table 2**); however, males were more likely to receive an oral antibiotic compared to female patients (51.4% vs. 48.6%, p=0.02). There were significant differences in the odds of receiving an antibiotic prescription depending on the setting of care. Patients were more likely to receive an antibiotic in an ED or UC facility compared to primary care settings (64.7% vs. 33.0%, p<0.0001). Of the clinicians prescribing antibiotics, MDs made up the majority (54.9%), followed by APRNs (35.8%), and PAs (7.4%). However, APRNs and PAs were more likely to prescribe antibiotics compared to MDs (78.8% vs. 54.9% p<0.0001) (**Table 2**).

Following multivariate regression (age, sex, location, prescribing clinician, race), only the encounter location was significant. In comparison to a primary care facility, presentation to either the ED or UC conveyed an increased odds of 10.91 of receiving an antibiotic (OR 10.91, 95% CI 5.67 to 20.98). When separating acute care settings, univariate regression showed that, relative to primary care visits, presentation to an UC was associated with a greater odds of receiving an antibiotic compared to patients seen in the ED (UC OR 26.44, 95% CI 9.52 to 73.39 versus ED OR 4.42, 95% CI 2.06 to 9.50) (**Table 3**).

Secondary Outcomes (Antibiotic Prescription)

Of those who did receive an antibiotic (n=679), 97.2% received an antibiotic that followed prescription practices dictated by the CPG. Significantly more children 7-12 years of age compared to those ≤6 years of age received an antibiotic that did not follow guidelines (57.9% vs. 42.1%, p=0.01). There were no differences by gender, race, location of the visit, or credentials of prescribing clinicians. Following multivariate regression analysis (age, sex, location, prescribing clinician, race), the odds of being prescribed an antibiotic that did not

Table 3. Odds Ratio For Receiving Antibiotic Vs Not Receiving An Antibiotic

	Univariate		Multivariate	
Variable	**Odds ratio**	**95% CI**	**Odds ratio**	**95% CI**
Age (years 7-12 vs 2-6)	0.74	0.49 to 1.12	0.67	0.40 to 1.10
Sex (Female vs Male)	1.6	1.06 to 2.41	1.48	0.89 to 2.43
Location (ED/Urgent care vs primary care)	11.76	6.25 to 22.12	10.91	5.67 to 20.98
Location (ED vs primary care)	4.42	2.06 to 9.50	*	*
Location (Urgent care vs primary care)	26.44	9.52 to 73.39	*	*
Prescribing clinician (PA/NP vs MD/DO)	3.29	2.00 to 5.41	1.25	0.70 to 2.20
Race (non-white vs white)	0.97	0.81 to 1.16	1.02	0.83 to 1.26
*= not included in multivariate regression model				

Table 4. Odds Ratio Of Receiving An Antibiotic That Followed Guidelines Vs Did Not Follow Guidelines

	Univariate		Multivariate	
Variable	**Odds ratio**	**95% CI**	**Odds ratio**	**95% CI**
Age (years - 7-12 vs 2-6)	3.01	1.19 to 7.59	2.97	1.17 to 7.57
Sex (Female vs Male)	0.95	0.38 to 2.37	0.88	0.35 to 2.22
Location (ED/Urgent care vs primary care)	1.44	0.51 to 4.06	1.29	0.43 to 3.84
Prescribing clinician (PA/NP vs MD/DO)	1.84	0.73 to 4.64	1.52	0.57 to 4.05
Race (non-white vs white)	1.08	0.72 to 1.61	1.13	0.75 to 1.70

follow guidelines was 2.97 for those aged 7 to 12 compared to patients ≤6 years of age (OR 2.97, 95% CI 1.17 to 7.57) (**Table 4**). Of those that received an antibiotic that did not follow guidelines (n=17), macrolides were the most common (88.2%) followed by clindamycin (5.9%), and trimethoprim-sulfamethoxazole (5.9%).

Other Medications

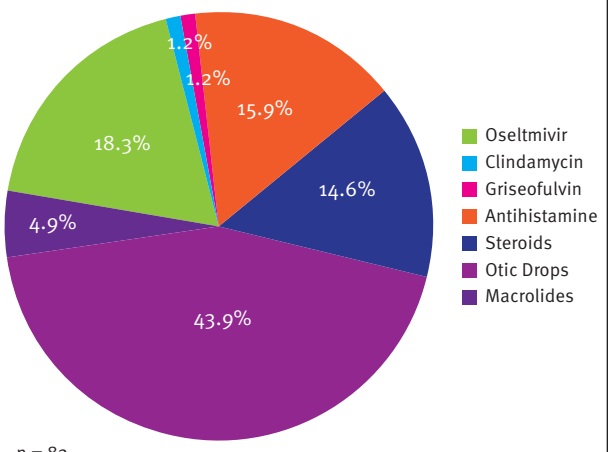
Eleven patients were prescribed non-antibiotic medications. These included: otic drops (antibacterial and/or steroid) (45.5%), oral steroids (36.4%), and oral/nasal antihistamines (18.2%). Of those who were prescribed medications in addition to an antibiotic (n=82), otic antibiotic drops (43.9%), and oseltamivir (18.3%) were the most common (**Figure 2**).

Discussion

Among a large, urban population of children presenting with AOM, 85.7% of patients in our sample were prescribed oral antibiotics at their initial encounter. The clinical setting in which patients were treated was most predictive variable among those examined for receiving an antibiotic prescription. Collectively, the ED and UC facilities were significantly more likely to prescribe oral antibiotics for AOM compared to primary care settings; however, in univariate analysis being seen in UC was associated with even higher odds of receiving an antibiotic than the ED. Of those who did receive an antibiotic prescription, the correct antibiotic was prescribed 97.2% of the time. Older children were more likely to receive non-first-line antibiotics.

Although the AAP guidelines recommend "watchful waiting" with close follow-up or antibiotic therapy treatment based on joint decision making, "watchful waiting" with close follow-up would avoid many antibiotic prescriptions as most cases of AOM are viral.[1] Additionally, in a study that evaluated 1,114 cases of AOM, only 35% of cases were classified as severe. Other studies have indicated a reduction in the incidence of severe AOM following the introduction of the pneumococcal conjugate vaccinations and the *Hemophilus influenzae* vaccinations.[8,9] For this reason, it is increasingly likely that most cases of AOM do not meet criteria as "severe." Our study demonstrated that antibiotic over-prescribing was common in our hospital system, especially in the acute care settings. Further studies are needed to understand the hesitant adoption of "watchful waiting" practices in the management of uncomplicated AOM at these clinical locations. "Watchful waiting" may hypothetically be avoided in these settings for many rea-

Figure 2. Other Medications Prescribed In Addition To Antibiotic



sons: clinician concerns for lack of patient follow-up, inability to observe for complications, more severe presentations tending to present for unscheduled, acute care, among others. Another reason for high antibiotic prescription rates in acute care settings may stem from parental belief that antibiotic administration results in quicker resolution of symptoms as well as poor caregiver assessment of the risks and benefits of antibiotic administration in children with viral respiratory infections.[10] This may be reflected by the higher numbers of older children (ie, >2 years) receiving antibiotics in comparison to other ages, as these children make up the population of those who attend daycare and kindergarten. Our study also found that <5% of patients among our sample who presented to UC did not receive an antibiotic prescription. Since UC clinicians care for patients they do not have a prior relationship with, children's caregivers may be less inclined to leave without receiving an antibiotic prescription.[11]

Time pressures may also be a factor in why we observed higher rates of antibiotic prescribing in ED and UC centers. Both the ED and UC are fast-paced environments with high patient volumes. Frequently, clinicians in these settings commonly feel they do not have enough time to spend with each patient. Unsurprisingly, clinicians are more prone to inappropriate prescribing decisions with shorter visits. Conversely, the longer clinicians spend with patients, the less likely they are to prescribe antibiotics.[12]

In our study, prescriber credentials did not appear to be a predictor of the decision to prescribe antibiotics. Other studies conducted in both pediatric and adult populations have demonstrated non-physician prescribers were more likely to prescribe antibiotics, and rates of "watchful waiting" were lower among PAs and NPs than physicians.[13,14] These differences could be due to varying levels of comfort and experience, but also due to patients and families being less inclined to accept recommendations from non-physician clinicians. A recent study from the University of Colorado demonstrated that a simple antimicrobial education course for prescribers decreased the frequency of prescribing antibiotics at the initial visit and increased the proportion of prescribers who employed "watchful waiting" techniques.[15]

It is encouraging that first-line antibiotics were selected in the vast majority of cases among the charts reviewed in our study. It is likely this is facilitated by the fact that antibiotic guidelines for pediatric AOM are straightforward and have not changed dramatically in recent years.[16] There remained, however, a small subset of patients in our study who were treated with non-first-line antibiotics. Non-first-line medications are generally more expensive than amoxicillin, putting a greater strain on both state funded insurance and private insurance systems.[17,18] We also observed macrolides were the most common inappropriate antibiotic prescribed. A recent meta-analysis suggested that when treating AOM, macrolides have a higher risk of clinical failures, which is believed to be attributable to increasing rates of *S. pneumoniae* resistance.[19]

Our study also found occasional prescribing of additional non-antibiotic medications for AOM. Medications such as antihistamines and nasal and oral steroids have a limited role in managing Eustachian tube dysfunction and have not been shown shorten the course of AOM. Furthermore, in cases where the tympanic membrane is intact and there is no evidence of otitis externa, otic antibiotic drops are not recommended.[20-22] Antivirals for influenza have been shown to be associated with a slight reduction in associated AOM in younger children with symptomatic influenza infections.[23] Our study showed that oseltamivir was prescribed in 18.3% of patients who received appropriate antibiotics, however, due to limitations of de-identified data and retrospective design, it is unclear if these patients also had influenza.

The "watchful waiting" approach for AOM centers around antibiotic stewardship. According to the Centers for Disease Control and Prevention (CDC), at least 30% of outpatient antibiotics prescribed in the United States are unnecessary.[24] There are about 8.7 million antibiotic prescriptions written annually for AOM alone in the United States.[5] Given how common the diagnosis of

AOM is, it represents one of the larger opportunities for improved stewardship. Antibiotic over-prescribing is often associated with unknown etiology of infections.[25] Furthermore, patients commonly present explicitly with requests for antibiotic prescriptions.[25]

A strength of this study is the large dataset from a diverse, urban setting from which the data were extracted. Consequently, however, the findings of our study would be most applicable to other large healthcare systems that serve low-income populations with high rates of ED utilization. Of all cases, the majority of cases of AOM in this study presented to the ED or UC (56.9%) compared to a national rate of 7.8% reported in a 2018 study. Low socioeconomic status, lack of access to primary care, lack of insurance coverage, and perceived urgency of conditions are among many reasons for increased ED usage within a hospital system.[26] Most caregivers within our population have low education and health literacy, particularly about common childhood illnesses, such as otitis media. Being born outside the United States, of minority ethnicity or race, having low educational achievement, younger age, or having a child publicly insured are correlated with low health literacy, which leads to increased rates of emergency room visits, and greater odds of non-urgent cases.[27] In one study with patient populations of low socioeconomic status in urban settings and publicly-run hospital systems, only 23.3% of pediatric patient caregivers attempted to contact their primary care office before going to the ED. Other caregivers who brought their child to the ED stated that they perceived lack of access to the primary care clinic, lack of knowledge of after-hour phone lines, and the belief that they would receive faster care in the ED.[28]

It is important to note the various limitations of this study. First and most importantly, this study was limited by retrospective design and the use of de-identified data, so sensitivity analyses were not feasible to determine the accuracy of statistical assumptions. Second, as data were extracted with the support of CCTS using the CRDW, clinically important information in the diagnosis of AOM, such as physical exam findings and vital signs, were unavailable. Instead, ICD-10 codes determined patient inclusion in our study. Therefore, it cannot be confirmed that patients who received otic drops did not have a tympanic perforation or myringotomy tubes, for example. Furthermore, patients' symptoms were not described, so it cannot be confirmed that patients who received oral antibiotics did not have severe AOM. Another limitation of this study included the lack of confirmation if the prescriptions were filled by the caregivers or if the antibiotics were prescribed with the understanding that it would only be filled if the patient's symptoms worsen after an appropriate period of observation, which may often have been the case. Therefore, it is likely that the prescription rates overestimated the actual antibiotic consumption rates, however, this would be expected to be similarly overestimated across settings. Additionally, location of care was determined based on the prescriber's department. Thus, if a prescriber worked in multiple departments, it is possible that their department at the time of prescription did not accurately reflect the site of care. Another limitation was that our multivariate regression model found that, while age predicted the odds of being prescribed an inappropriate antibiotic, data on many other variables, such as insurance coverage, were unavailable. Finally, this data was collected during 2016-2020 prior to the COVID-19 pandemic. The number of UC centers has increased by more than 50% since 2016, and public use of UC has also increased dramatically during this time.[29] Therefore, the decision of caregivers to seek care when their children have otalgia in UC vs ED vs primary care settings is likely markedly different compared to just a short time ago. For this reason, after the COVID-19 pandemic, it is likely that both clinician and patient opinions about antibiotic prescribing have changed. However, one recent, large, retrospective study of patients in Dubai showed ongoing over-prescribing of antibiotics post COVID-19.[30] More studies are necessary to determine how caregivers and clinicians behave in terms of appropriate use of antibiotics for pediatric AOM in the wake of the many changes associated with COVID-19.

"Given how common the diagnosis of AOM is, it represents one of the larger opportunities for improved stewardship. Antibiotic over-prescribing is often associated with unknown etiology of infections."

The AAP guidelines recommend "watchful waiting"

with close follow-up or antibiotic therapy based on joint decision making for most children with AOM. This study is important in identifying which clinicians and locations may be more likely to deviate from these guidelines, especially in an urban setting with diverse patient populations. Future research would be of value to determine if the trends observed in our study population before COVID-19 persist, given the rapid changes in UC utilization and clinician credentials and changes among rural and suburban EDs and UC centers. Many organizations and governmental agencies, including CDC, the Urgent Care Association, and Infectious Disease Society of America, have created task forces and issued guidelines surrounding antibiotic stewardship in the outpatient setting in recent years.[31] Importantly, to add to our work, prospective studies of treatment decisions for pediatric UC patients with AOM are needed to determine if efforts around antibiotic stewardship in the outpatient population are leading to improvements in guideline coherent prescribing and which additional areas represent the greatest opportunities to invest our continuing efforts around this important goal.

Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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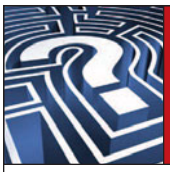


CLINICAL CHALLENGE: CASE 1

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@jucm.com.

48-Year-Old With Foot Pain After Hiking

Figure 1.

A 48-year-old man presents to urgent care complaining of pain in his right foot after hiking last weekend on a rough trail. He denies any trauma or specific injury.

Review the image taken 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
- Foot tendonitis
- 3rd metatarsal fracture
- Suspected 4th metatarsal stress fracture
- 2nd proximal phalange fracture

Diagnosis
The correct diagnosis is a suspected 4th metatarsal stress fracture. The x-ray demonstrates periostitis adjacent to mid/distal 4th metatarsal. Fatigue fractures such as this are common in athletes and those in military service, which is why they are also known as "march" fractures. They may be distinguished from insufficiency fracture, which occurs in abnormal bone. Risk factors include female sex, low bone density, nutritional disorders or deficiencies, long-distance running, inappropriately short recovery time, and inadequate shoes.

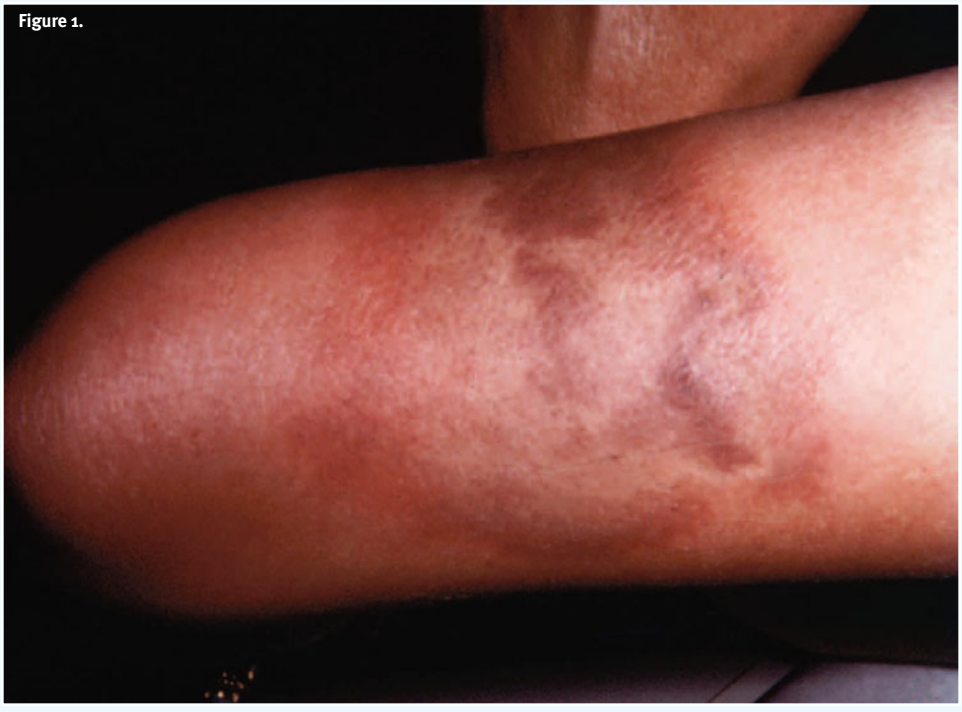
What to Look For
- Periosteal reaction/elevation may take up to 2 weeks to be detectable.
- Due to poor radiograph sensitivity, during the first few weeks after the onset of symptoms, x-rays of the affected area may look normal.

Pearls for Urgent Care Management
- Rest and ice are the mainstays of treatment
- Consider a hard-soled shoe or cam boot to help with rest
- Non-steroidal anti-inflammatory drugs are the best agent for pain management
- Consider repeat imaging in 2-4 weeks if diagnosis is unconfirmed at the time of presentation

CLINICAL CHALLENGE: CASE 2

42-Year-Old With Stinging Sensation

Figure 1.

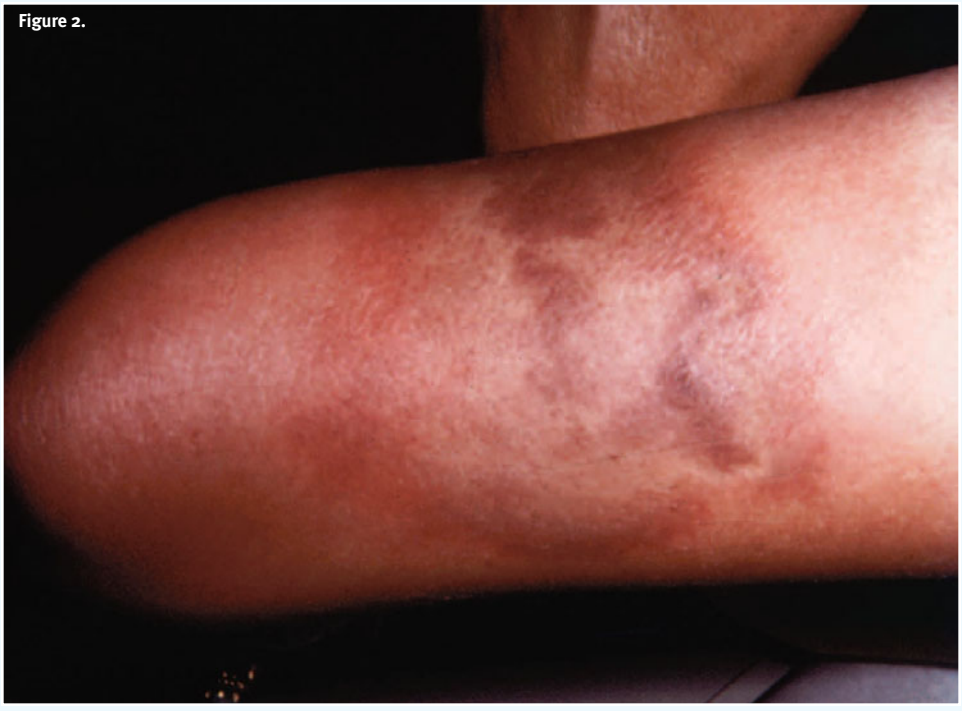


A 42-year-old woman presented to urgent care early in the morning saying that she felt a stinging sensation on her arm while she was cleaning her basement the previous day. She thinks it might be an insect bite but didn't see anything. She had subsequent marked pain at the site and over the past few hours developed nausea and muscle aches. On physical examination, the patient had a temperature of 101.3°F (38.5°C). There were reddish-brown reticulate patches with intervening pallor and a rim of erythema on the posterior arm.

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

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

Figure 2.



Differential Diagnosis

- Mosquito bite
- Cellulitis
- Erythema migrans
- Recluse spider envenomation

Diagnosis

The correct diagnosis in this case is recluse spider envenomation. *Loxosceles* spiders are typically brown in color, measure 2-3 cm from leg to leg, and exhibit a dark, violin-shaped spot on the cephalothorax. The initial spider bite is usually painless, however, it may produce a sharp, stinging sensation, and severe burning pain and pruritus develop at the bite site within 2-6 hours.

The incidence of systemic involvement is rare and do not correlate with local findings. As early as 24 hours after envenomation, fever, arthralgias, nausea, vomiting, diarrhea, rash, myalgias, and headache can develop. With more severe systemic illness, hemolysis is the predominant feature. Thrombocytopenia, disseminated intravascular coagulopathy, proteinuria, renal failure, angioedema and death have been reported.

What to Look For

- Over time, the bite wound typically develops an erythematous halo surrounding a central hemorrhagic vesicle. Occasionally, the central vesicle will be surrounded by an area of ecchymosis, surrounded by a ring of pallor and an outer ring of redness.
- In most cases, the lesions at the site of the bite will resolve in a week.
- However, necrosis may form, usually with the hemorrhagic vesicle becoming necrotic with an eschar by day 3-4.
- After 2-5 weeks, the eschar sloughs, leaving an ulcer that often heals by secondary intention, though some may require skin grafting.
- In severe cases, there can be progressive tissue necrosis that is particularly severe in fatty regions such as the buttocks or thighs.

Pearls for Urgent Care Management

- For local effects, use of wound care (ice and elevation) and pain management (acetaminophen and non-steroidal anti-inflammatory drugs) are the mainstay of therapy
- Consider tetanus prophylaxis
- If signs of infection such as erythema, induration or fluctuance, treatment with antibiotics for cellulitis is indicated
- For patients with necrosis or systemic symptoms, transfer to a higher level of care is needed

INSIGHTS IN IMAGES

CLINICAL CHALLENGE: CASE 3

57-Year-Old With Progressive Dyspnea

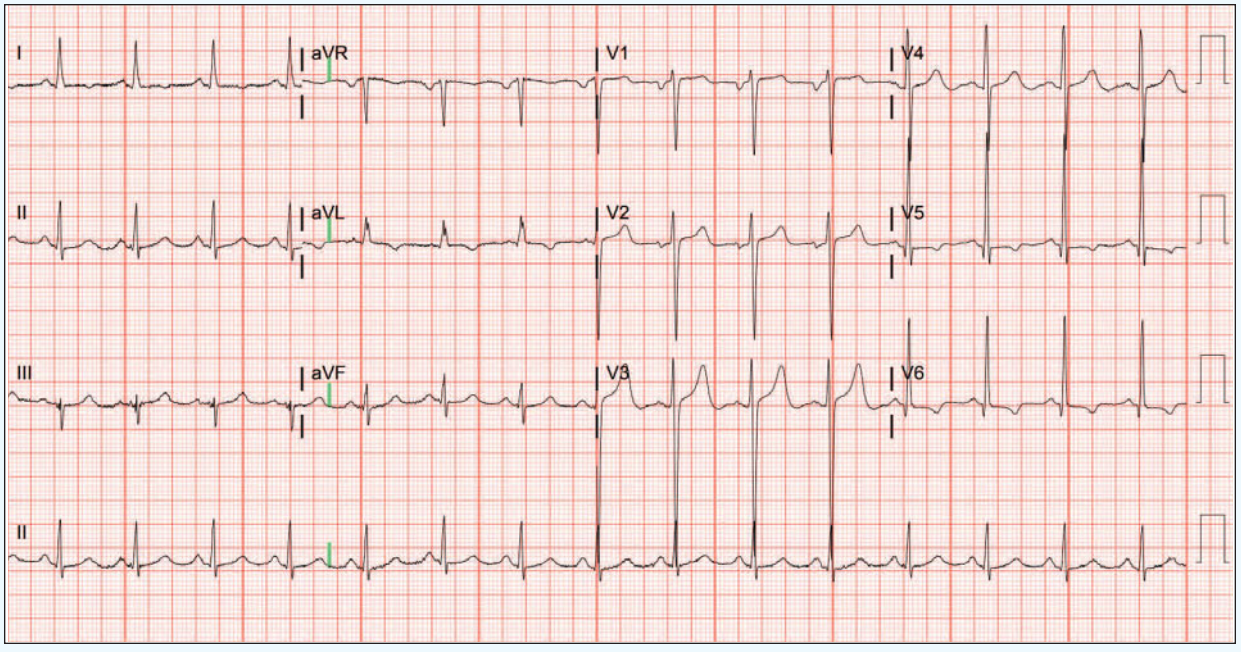


Figure 1: Initial ECG

A 57-year-old man presents to urgent care with progressive dyspnea for 1 month. The patient has a history of unmanaged hypertension.

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

Case presented by Benjamin Cooper, MD, McGovern Medical School, The University of Texas Health Science Center at Houston, Department of Emergency Medicine.

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

ECG STAMPEDE

Figure 2: LVH with asymmetric T-wave inversions and ST-depressions in the lateral leads (asterisks)

Differential Diagnosis

- Diffuse subendocardial ischemia
- Left ventricular hypertrophy (LVH)
- ST-elevation myocardial infarction (STEMI)
- Non-ST-elevation myocardial infarction (NSTEMI)
- Wellens syndrome

Diagnosis

The correct diagnosis in this case is left ventricular hypertrophy. The ECG reveals a sinus rhythm with a rate of 91 beats per minute, large amplitude QRS complexes, and T-wave inversions primarily in the lateral leads (I, aVL, V_5, V_6). The morphology and distribution of the T-wave inversions are particularly important to note as this distinction can help differentiate chronic, stable changes from acute changes that require more immediate attention.

Several electrocardiographic criteria exist for left ventricular hypertrophy, and none of them are particularly sensitive (~50%), but they are quite specific (85-90%).[1] Two of the more commonly cited criteria are shown in **Table 1**.

Repolarization abnormalities are commonly associated with left ventricular hypertrophy, namely asymmetric T-wave inversions and ST-depressions that predominate in the lateral leads—the so-called "strain" pattern, as with this ECG. It is not uncommon to see discordant ST changes associated with LVH, meaning ST changes in the opposite direction as the QRS complex. Notice that ST-depressions are seen in leads with up-going QRS complexes (I, II, aVL, V_5, V_6), and ST-elevations are seen in leads with down-going QRS complexes (V_1, V_2, V_3). While multilead ST-depression and aVR ST-elevation has been described as a pattern strongly associated with left main or triple vessel disease (i.e. diffuse subendocardial ischemia), it is also commonly seen with LVH.[2]

Table 1. Select Electrocardiographic Criteria for Left Ventricular Hypertrophy (QRS Amplitude)

Sokolow-Lyon Criteria	$S V_1 + R V_{5,6} > 35$ mm OR R aVL > 11 mm
Cornell Criteria	R aVL + $S V_3$ > 28 mm for men OR > 20 mm for women

T-wave inversions can also indicate acute ischemia, but the T-wave inversions of acute ischemia tend to be symmetric. When deep and symmetric T-waves are seen in the anterior precordial leads while the patient is chest-pain free, it may indicate critical stenosis of the left anterior descending artery—Wellens syndrome.[3,4]

Although there are ST-elevations in V_1 through V_3, they do not represent STEMI. ST-elevations associated with STEMI are often straight or convex upward in appearance (ie, "tombstone" morphology). If the patient were having an acute myocardial infarction, a more acute presentation would be expected, as opposed to 1 month of progressive dyspnea. Most importantly, comparison to a prior ECG is quite helpful, if available. This patient was transferred to an emergency department and ultimately diagnosed with severe aortic stenosis.

What to Look For

- Electrocardiographic findings of LVH include large-amplitude QRS complexes.
- LVH can have associated repolarizations abnormalities including ST-depressions and asymmetric T-wave inversions in the lateral leads (I, aVL, V_5, V_6).
- Compare to prior ECGs when available.

Pearls For Initial Management, Considerations For Transfer

- If the patient is acutely symptomatic with either chest pain, shortness of breath, or with unstable vital signs (ie, hypoxia) then immediate referral to the emergency department is indicated.
- If ECG reveals classic LVH findings but is not acutely symptomatic, the patient likely needs their blood pressure controlled as hypertension is the most likely culprit; however, acute control is not necessary.

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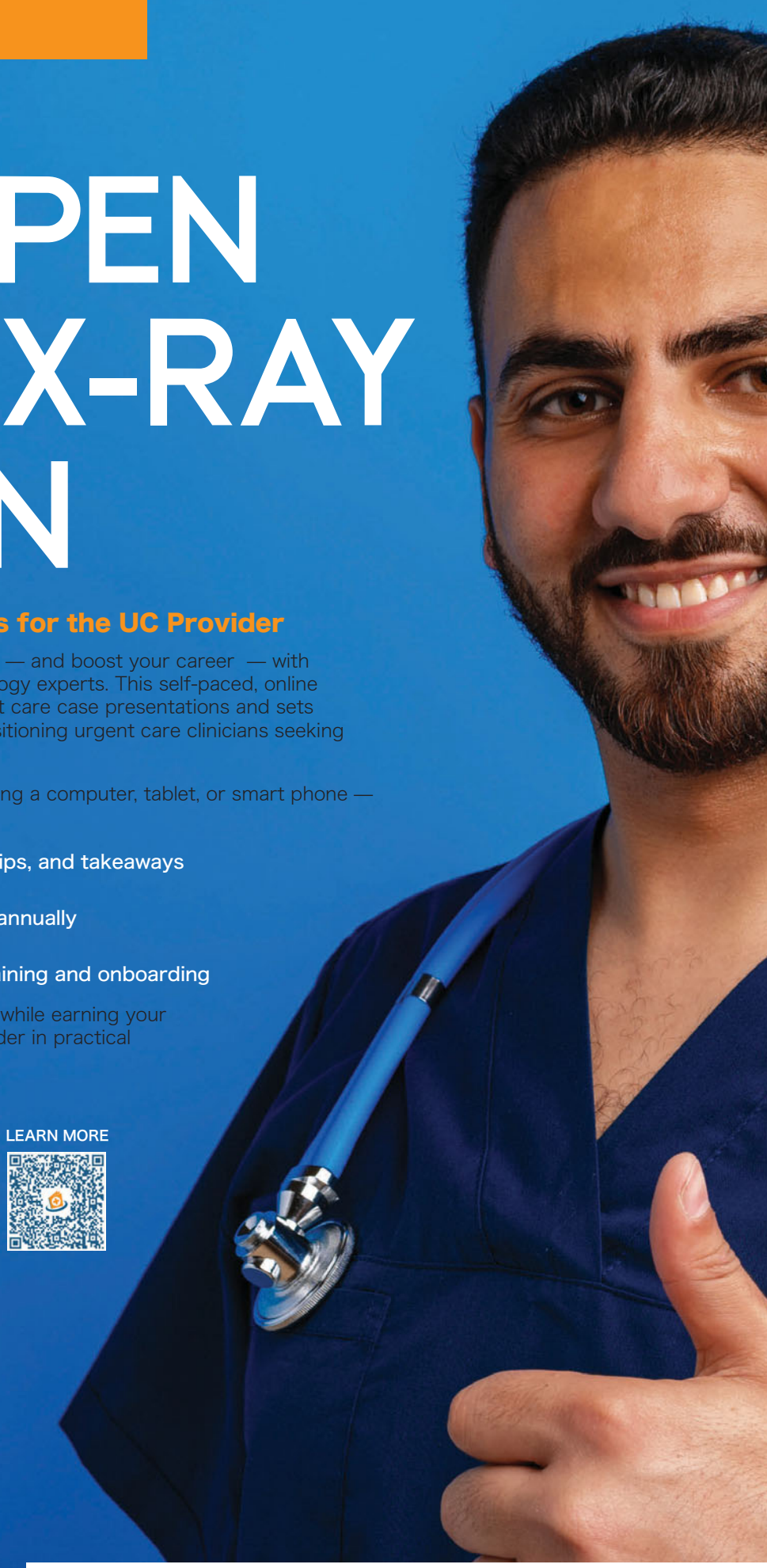

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Contracting: Primary Care Versus Urgent Care

Heather Rothermel

When considering contracting for your clinic, it will be important to know how you plan to market your clinic and to ensure that you align with the needs of your community. Will you be a primary care practice, an urgent care practice, or a blended practice?

Thoroughly analyzing your market and competition should help guide this decision, but there is a bevy of things to consider—everything from contract type, credentialing requirements, reimbursement methodologies, participation criteria, and the impact to members of the health plans you contract with.

Primary Care

- Lower co-payment typically applies for members
- Members may be assigned to your practice, and you may be required to accept a certain amount of membership
- Individual provider credentialing is almost always required
- Payers will typically accept the following provider types at a primary care clinic: general practitioners, family practitioner, internal medicine, pediatrician
- Emergency medicine providers have difficulty obtaining primary-care-provider contracts and getting credentialed
- Reimbursement is typically paid as fee for service and may be lower than urgent care reimbursement
- Providers are typically listed in provider directories individually and marketed individually—not as the facility
- Some payers may discourage using "urgent care" in the name of your practice

Urgent Care

- Higher co-payment typically applies for members
- Facility credentialing may be required
- Reimbursement is typically a flat or global rate, meaning one negotiated rate is paid regardless of the acuity of care provided during the visit
- The facility itself will be listed in the provider directory, making it easier for members to identify your clinic as participating
- Specific hours of operation may be required, and some payers may be very specific about weekday evening hours (after 5PM) and weekend hours
- May require special accreditation (ie, Urgent Care Association), which costs additional money and may require a site visit
- Generally, the agreement will exclude primary care visits and services (ie, vaccinations, well care, maintenance, etc.)
- May require provider to forward information to patient's PCP for follow-up care

Hybrid Practice

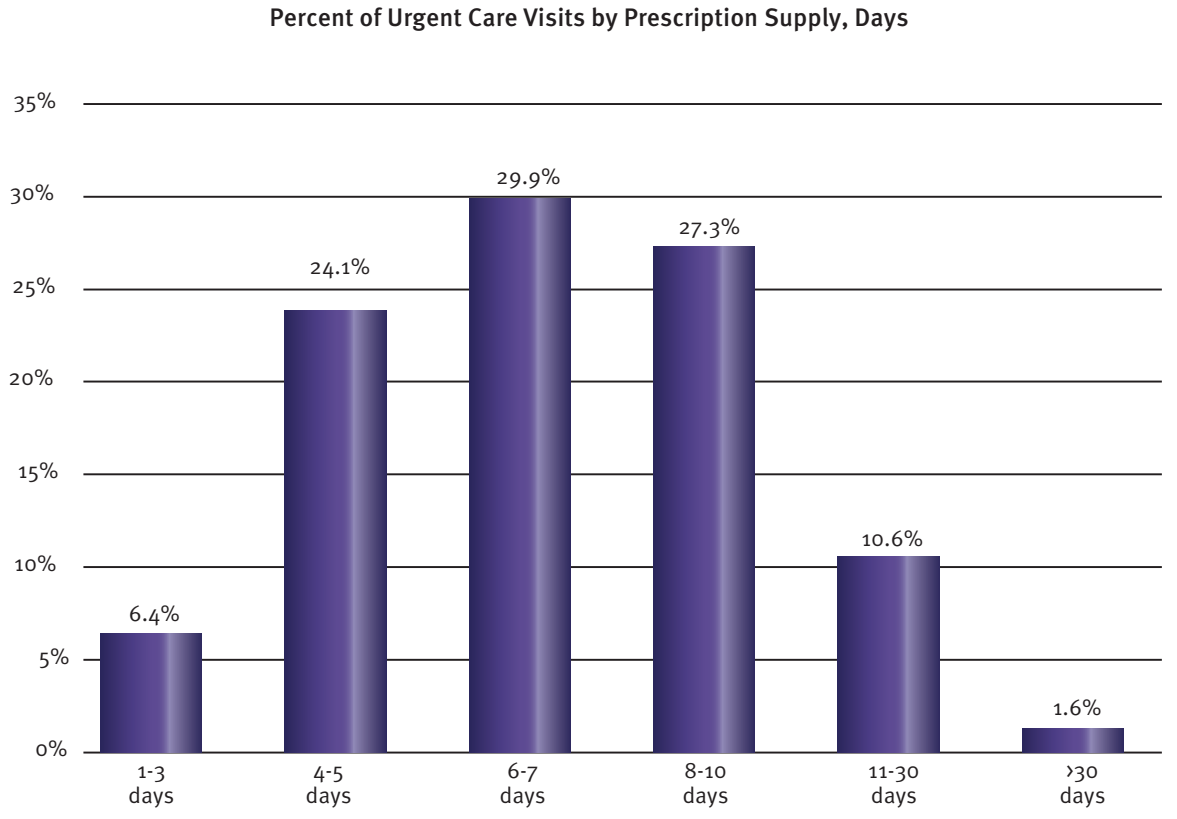
If you want to run a hybrid practice, there are 2 options to consider. The first would be to contract as a primary care or a group practice. In this scenario, you would want to make sure there is reimbursement for any after-hours services that you render. Individual provider credentialing will be required, and all providers must be approved by the plan prior to being reimbursed as an in-network provider. Fee-for-service reimbursement is likely, and it will be important for you to collect the applicable fee schedule to understand your reimbursement.

The other option to consider is contracting as both a primary care and an urgent care. This would require 2 tax identification numbers and contracting for each entity would be separate. In this scenario, you will want a clear understanding of the contracting and credentialing requirements for each entity. There will likely be 2 different reimbursement methodologies to keep track of: 1 for your urgent care; and 1 for your primary care. After considering all of these variables, you will want to make a decision on how to move forward. ■

Heather Rothermel is Contracting Operations Lead at Experity.

Prescription Duration for Urgent Care Patients

Alan A. Ayers, MBA, MAcc



Whereas primary care is focused on prevention and management of chronic conditions, urgent care has historically been defined as episodic treatment for non-acute or acutely rising conditions—which are not medical emergencies but generally call for evaluation within 24 hours. As such, it would be expected that urgent care providers would prescribe medications only for the duration of a current infection or until a patient can follow-up with a specialist or primary care physician, for example.

We conducted an analysis of 17.8 million prescriptions written in 2023 by users of the Experity platform and found that 88% of prescriptions were written for 10 days or less. Additionally, 78% of prescriptions were written for exactly 5, 7, or 10 days. And while 6% of prescriptions were written for exactly 30 days, less than 2% of the total were written for greater than 30 days. The breakdown of prescription days is illustrated in the charts. ■

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

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