cost solution to contain healthcare expenses while providing quality patient care.²

Methods

Over the past year, there has been increased discussion among providers at a university-affiliated urgent care clinic in North Carolina regarding the advantages and disadvantages of a C&S as part of the protocol for the treatment of uncomplicated UTIs. The debate between providers embodied the pros and cons of both approaches, as well as considerations of patient and provider time costs and ultimately the cost-effectiveness of the laboratory procedure.

A quality improvement project was developed to address this concern. Based on current ACOG clinical guidelines, the project's goal was to ascertain the occurrence of unresolved UTI symptoms if C&S were not initially ordered for patients being treated for uncomplicated UTIs in healthy, adult nonpregnant females 18 to 65 years of age in an urgent care setting.

The urgent care clinic where the investigation took place is fast-paced and diverse, and an institution where patients visit for a myriad of urgent healthcare concerns throughout their lifespan. A substantial number of women within the target population present to this facility with UTI complaints. Based upon peer provider discussions, urine cultures represent a significant portion of the laboratory specimens obtained.

The population chosen for the project were healthy, nonpregnant females, 18 to 65 years of age, who presented to the urgent care setting with burning upon urination, urinary urgency and/or frequency, and possible blood, leukocytes, and nitrates identified in their POCT urinalysis results. However, these patients did not present with flank pain, fever, vaginal irritation, or discharge. The exclusion criteria were males, pregnant females, females with a history of recent UTIs, recent antibiotic use, diabetes, kidney disease, immunosuppression, or females below 18 or above 65 years of age.

Data were collected from electronic medical records (EMRs) retrospectively via chart review for 1 month prior to the intervention. During the preintervention phase, the number of patients treated for an uncomplicated UTI was compared to the number of patients who either returned to the urgent care with unresolved symptoms after initial treatment or were called and needed follow-up for unresolved symptoms postvisit.

Using the current, evidence-based ACOG guidelines for the treatment of uncomplicated UTIs as the foundation, a quality improvement clinical education session was presented to the clinic providers. The inter-

Table 1. QI Project Data Collection Results		
	Preintervention	Postintervention
Number of participants	20	20
Mean age	39.35 years	36.85 years
Burning upon urination (%)	13 (65%)	17 (85%)
Urinary urgency	11 (55%)	5 (25%)
Urinary frequency	17 (85%)	14 (70%)
Blood in urine	14 (70%)	17 (85%)
Nitrates in urine	5 (25%)	6 (30%)
Leukocytes in urine	15 (75%)	13 (65%)
Urine culture and sensitivity sent	17 (85%)	11 (55%)
Full resolution of symptoms	12 (60%)	19 (95%)
Postvisit ED follow-up	2 (10%)	1 (5%)
Postvisit PCP visit	4 (20%)	0 (0%)
Postvisit urgent visit	2 (10%)	0 (0%)

vention advised against the use of C&S laboratory tests in the assessment of uncomplicated UTIs, and showed the evidence supporting this change. With no C&S laboratory tests being ordered for the subject population, postintervention data were collected through chart review for 1 month.

Results

A total of 40 women met the inclusion criteria for both pre- and postintervention sampling. Data were collected from 20 preintervention EMRs and 20 postintervention EMRs. The preintervention data showed the average age of the women in this group to be 39.35 years of age. A C&S was sent for 17 (85%) of the women. When called postvisit, eight (40%) did not have full resolution. Two (10%) stated they needed to follow up in the emergency department. Four (20%) followed up with their primary care provider, and two (10%) returned to an urgent care. (See Table 1). The postintervention data showed the average age of the women in this group to be 36.85 years of age. A C&S was sent for 11 (55%) of the women. When called postvisit, one (5%) did not have full resolution. One (5%) stated they needed to follow up in the ED, none followed up with their PCP, and none returned to UC. ACOG guideline application resulted in a 30% reduction in the ordering of a C&S in this population with no increase in the rate of followup needed in this postintervention group.

Conclusions

The results of the quality improvement project supported ACOG's clinical guidelines regarding the assessment of uncomplicated UTIs in the nonpregnant, adult female population. The educational session attended by the providers appeared to play a key role in reducing unnecessary C&S studies and increasing provider awareness of ACOG guidelines for current evidence-based practice. These findings also supported the position that quality patient care can be maintained while healthcare costs are reduced for this population in the urgent care setting.

Projects such as the one discussed here improve patient care outcomes by promoting and implementing evidence-based clinical practice guidelines. Ensuring guideline implementation and sustainability involves ongoing open communication and active involvement by all stakeholders of the urgent care team.

Limitations

The project improved patient outcomes and reduced unnecessary lab testing, but did have limitations. The sample size was lower than the projected sample size. There was a reduction in the number of patients who presented to the urgent care during the time of data collection, possibly due to the impact of COVID-19. Replication of this project on a larger or continued scale, or using an experimental study format, would be helpful in confirming these findings. ■

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CLINICAL CHALLENGE: CASE 1

In each issue, *JUCM* will challenge your diagnostic acumen with a glimpse of x-rays, electrocardiograms, and photographs of conditions that real urgent care patients have presented with.

If you would like to submit a case for consideration, please e-mail the relevant materials and presenting information to *editor@jucm.com*.

A 75-Year-Old with Chest Pressure



Case

The patient is a 75-year-old male who presents with a primary complaint of pressure in his chest. He denies chest pain, dizziness, or "anything like a heart attack."

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

THE RESOLUTION



Differential Diagnosis

- Diffuse panbronchiolitis
- Pulmonary metastases
- Septic pulmonary emboli
- Silicosis
- Tuberculosis

Diagnosis

The x-ray shows multiple bilateral, well-circumscribed, rounded masses. The largest appears in the right posterior perihilar region. There are many causes for multiple pulmonary masses, however metastases are the most common.

Learnings/What to Look for

- The priority is to identify the lesion in the lung and distinguish a nodule from a mass
 - A pulmonary nodule is defined as a small (<30 mm), wellcircumscribed lesion, completely surrounded by normal lung parenchyma

- A pulmonary mass is defined as a pulmonary opacification of >30 mm
- Common causes of pulmonary nodules are hamartomas, mucous gland adenoma, histiocytoma, and lipomas. The most common cause of pulmonary mass is malignancy. Other causes of pulmonary masses include autoimmune disease, fungal infections, and tuberculosis.

Pearls for Urgent Care Management

- After ruling out cardiac causes for the patient's symptoms, additional imaging with a CT scan is indicated
- A rapid referral to an oncologist is often frequently warranted

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



CLINICAL CHALLENGE: CASE 2

A 6-Year-Old Boy with a Lesion on His Ear



Case

The patient, a 6-year-old boy, presented to a pediatric urgent care center for a well-child visit. In the exam room, the father pointed out a red lesion on the helical rim of the patient's ear. The papule was smooth and well-defined and didn't seem to bother the boy. The father reports that he and the boy's mother have grown concerned as they've noticed it develop over several months. View the photo and consider what your diagnosis and next steps would be. Resolution of the case is described on the next page.

THE RESOLUTION



Differential Diagnosis

- Dermatofibroma
- Lobular capillary hemangioma
- Melanoma
- Spitz nevus

Diagnosis

The lesion shown in the photo was diagnosed as a Spitz nevus. Spitz nevi, also known as spindle and epithelial cell nevi or benign juvenile melanoma, are benign melanocytic nevi that occur most commonly in childhood and adolescence. Rarely, congenital Spitz nevi present at birth.

Learnings/What to Look for

Spitz nevus lesions are often red, pink, or (less commonly), dark brown, and appear as well-defined, smooth, firm, flat- or dome-shaped nodules and papules often <6 mm in diameter

- The majority of lesions are solitary, but rarely they can be multiple and widespread (eruptive disseminated) or localized (agminated) in one area
- The importance of these lesions lies in their frequent histopathologic confusion with melanoma. Spitz nevi represent the benign diagnosis within a spectrum, which extends to contain increasingly atypical features in atypical Spitz tumors and Spitz melanomas
- Lesions can develop slowly or appear quite rapidly. Without excision, lesions may remain stable for years, evolve into compound nevi, flatten over time, or involute spontaneously

Pearls for Urgent Care Management

- Benign lesions do not require treatment but should be monitored for changes. Measuring and photographing the lesion is useful in this regard
- Referral to dermatology is recommended for nevi that exhibit concerning features or new changes

Acknowledgment: Images and case presented by VisualDx (www.VisualDx.com/JUCM).



A 65-Year-Old Man with Shortness of Breath and a History of Heart Failure



Figure 1.

A 65-year-old male with a history of heart failure presents to an urgent care center with shortness of breath of 2 days duration. He denies chest pain, nausea, or vomiting. He reports that he ran out of his medications about a week ago. View the ECG taken and consider what your diagnosis and next steps would be. Resolution of the case is described on the next page.

(Case presented by Catherine Reynolds, MD, McGovern Medical School, Department of Emergency Medicine, The University of Texas Health Science Center of Houston.)

THE RESOLUTION



Figure 2. An example of a sinus rhythm with a normal P wave axis—upright in leads I and II (1), inverted in aVR (*), and biphasic in V1 (circle).

Differential Diagnosis

- Myocardial ischemia
- Myocardial infarction
- Nonspecific intraventricular conduction delay
- Atrial tachycardia
- Hyperkalemia

Diagnosis

The correct diagnosis is atrial tachycardia with abnormal P wave axis. The ECG illustrates an atrial tachycardia with a rate around 115 beats per minute, with three PVCs.

Learnings/What to Look for

Atrial tachycardia is an arrhythmia that occurs when the electrical signal in the heart originates from an atrial site other than the sinoatrial node. An ectopic atrial focus can be recognized by identifying the P wave axis.

The P wave represents atrial depolarization. Sinus rhythm is present when the sinoatrial node generates a signal that depolarizes the atria.

The sinoatrial node is a complex cluster of cells that exists at the junction of the superior vena cava and the right atrium and is the dominant pacemaker under normal circumstances. When the sinoatrial node generates the depolarizing impulse, the P wave will have an axis between o° and +75°—upright in leads I and II, inverted in aVR, and frequently biphasic in V1. Depolarization of the right followed by left atria fuse together to form the typical monophasic P wave seen in leads I and II (**Figure 2**).

Derangements of the P wave axis are caused by an impulse originating from an ectopic atrial focus instead of the sinoatrial node. In our case, the P wave is inverted in the inferior leads and upright in aVR, indicating impulse generation from a low atrial site (**Figure 3**).

The inverted P waves on our patient's ECG merge with the T waves to give the appearance of ischemic T wave inversions; however, a holistic approach to the ECG will help to reveal the presence of P waves consistent with atrial tachycardia. This rhythm is not inherently dangerous, as it is very similar to a sinus tachycardia. It is important to note, however, that as with most cases of tachycardia, atrial tachycardia may serve as a compensatory mechanism in patients with hypo/hypervolemia, sepsis, or many other conditions. Atrial tachycardia usually results from enhanced automaticity, the accelerated generation of an action potential by drugs, various forms of cardiac disease, electrolyte disturbances, or alterations of autonomic nervous system tone.^{1–3}

THE RESOLUTION



Figure 3. Inverted P waves (\uparrow) in the inferior leads and upright P waves in aVR (*).

Pearls for Urgent Care Management

- An abnormal P wave axis is the key to recognizing that a rhythm is not originating from the sinus node, but from an ectopic atrial focus
- Stable atrial tachycardia is not usually dangerous, but transfer may be considered in symptomatic patients or when the tachycardia is excessive
- Consider compensatory etiologies and treat the underlying condition if it exists; otherwise, outpatient referral to cardiology is sufficient

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