

## A Retrospective Assessment of the Utilization of Urinalysis, Urine Culture Collection, and Antibiotic Use in the Emergency Department: A Quality Improvement Project

**Purpose:** Previous studies have shown that urinalysis and urine cultures are commonly ordered by physicians in the emergency department in patients without complaints of UTI symptoms. Positive urinalysis and urine cultures in asymptomatic patients can result in patients receiving unnecessary antibiotics leading to unwanted adverse events, antimicrobial resistance, and inappropriate treatment of asymptomatic bacteriuria. The purpose of this study is to assess how many patients had a true indication for urinalysis and urine culture versus how many patients received each, and how many patients received unnecessary antibiotics for asymptomatic bacteriuria.

**Methods:** This retrospective cohort study included patients who were admitted from the emergency department (ED) and were greater than 18 years old with a urinalysis or urine culture ordered in the ED between July 1, 2021 and July 10, 2021. Exclusion criteria were patients admitted to the ICU, patients being treated for a UTI prior to admission, and no documented review of systems. The primary outcome was the percent of patients who received a urinalysis and/or urine culture in the ED versus the percent of patients in which either were indicated. Secondary outcomes included associated cost and antibiotic use due to unnecessary urinalysis and urine cultures. Indications considered appropriate for obtaining a urine culture include a positive urinalysis plus symptoms of UTI (pain on urination, frequency, urgency, flank pain/tenderness, and suprapubic tenderness), new onset or worsening sepsis without another source, fever or altered mental status without another source, and increased spasticity, autonomic dysreflexia, or sense of unease in patients with spinal cord injuries. Other indications include patients who are pregnant or undergoing urogenital surgery with or without symptoms. A positive UA was defined as the presence of leukocyte esterase, positive nitrites, > 10 WBC, or presence of bacteria. Descriptive statistics were used in this study.

**Results:** This study screened 168 patients admitted to the hospital from the ED for inclusion/exclusion criteria. Fifty-seven patients met criteria and were included. Of these patients, 56 (98.2%) had a urinalysis performed in the ED while only 20 (35.1%) had an indication for a urinalysis. Six patients had complaints of urinary symptoms or flank pain, two patients had a sepsis workup with an unknown source, and 11 patients had other compelling indications for a UA. Forty-two patients (73.7%) had a urine culture performed in the ED while only 5 (11.9%) had an indication for a urine culture. Six patients inappropriately received antibiotics for asymptomatic bacteriuria.

**Conclusion:** While the majority of patients received a urinalysis in the ED, less than half had a true indication. Likewise, many providers ordered urine cultures for patients without an indication. Commonly, urinalysis and urine culture were ordered at the same time. This can lead to needless spending of healthcare dollars, increased workload for lab technicians, and in some cases unnecessary antibiotic use. Possible solutions to this problem include ED provider and pharmacist education and changing the design of order sets to include urinalysis with reflex to microscopy only in the setting of a positive urinalysis.