

Urine Culture Clinical Decision Support Menu for Reducing Inappropriate Lab Ordering

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Antibiotic treatment of asymptomatic bacteriuria (ASB) is unnecessary except in pregnant women or those undergoing invasive urologic procedures.¹ Unnecessary treatment of ASB is an important driver of inappropriate antimicrobial use (IAU), leading to antimicrobial resistance, *Clostridioides difficile* infection, adverse drug events, and increased costs². Because ASB requires detection to be treated, unnecessary urine cultures (UC) are a key cause of IAU.³ Strong evidence supports not obtaining a UC from asymptomatic patients.¹

To reduce unnecessary UC orders at the Minneapolis Veterans Affairs Health Care System (MVAHCS), UC orders within the electronic health record (EHR) were redirected to a UC clinical decision support (CDS) menu (Figure 1). Selection of an indication from the defined list is required to place a UC order and provides tracking. UC order data was obtained from the Corporate Data Warehouse (CDW), the VA's data program. Patient bed days were collected from a CDW dashboard developed by the Iowa City Veteran's Affairs Health Care System. Data was visualized using Microsoft Power BI™ platform.

The UC CDS menu was implemented at the MVAHCS in September 2020. UC orders from 16 months prior to implementation (9/1/2018 - 12/31/2019) was compared to orders 16 months after implementation (9/1/2020 - 12/31/2021). Data from 1/1/2020 - 8/31/2020 was not included due to atypical patient care patterns during the COVID-19 pandemic.⁴ The monthly number of UC orders after implementation significantly decreased from an average of 765 to 564, a 26.3% reduction ($P < .001$; 2-sided t-test) (Figure 2). The average patient bed days prior to and following implementation was not significantly different (Figure 3). Most UC orders came from the UC CDS menu (8103, 89.8%) compared to orders placed from other order menus or directly from the drug file (920, 10.2%). The most common indication selected was dysuria, frequency, and urgency (4050, 44.9%) followed by fever or sepsis (1230, 13.6%) then pre-operative urologic screening (1056, 11.7%) (Figure 4).

Implementation of a UC CDS menu within the MVAHCS EHR resulted in significantly fewer UC orders. Most UC orders had an appropriate indication suggesting the decrease was primarily due to preventing unnecessary UC orders.

Figures:

URINE CULTURE MAIN ORDER MENU

02 Minneapolis Clinical On-Call Schedule (Infectious Disease)

Urine Culture is NOT indicated for the following conditions alone:

- Cloudy urine
- Malodorous urine
- Discolored urine
- When a urinary catheter is placed
- Automatic on admission
- End of therapy re-testing

Urine cultures should be ordered in patients with symptoms of a urinary tract infection, during pregnancy at appropriate screening intervals, and prior to an invasive urologic procedure.

Select indication for urine culture your patient has to place lab order:

- ← 10 Fever or sepsis with no other identifiable cause
- ← 12 Dysuria, frequency, or urgency
- ← 14 Flank, suprapubic, or pelvic pain
- ← 16 CVA tenderness
- ← 18 Acute hematuria
- ← 20 Pre-operative screening for urologic procedure
- ← 22 Pregnant and due for screening
- ← 24 Increased bladder spasticity or autonomic dysreflexia in patients with spinal cord injury or neurologic deficit
- ← 26 Altered mental status with no other identifiable cause
(note that UC not usually indicated, call ID with questions)

FIGURE 1. Urine culture clinical decision support menu. Urine culture orders are items numbered 10-26.

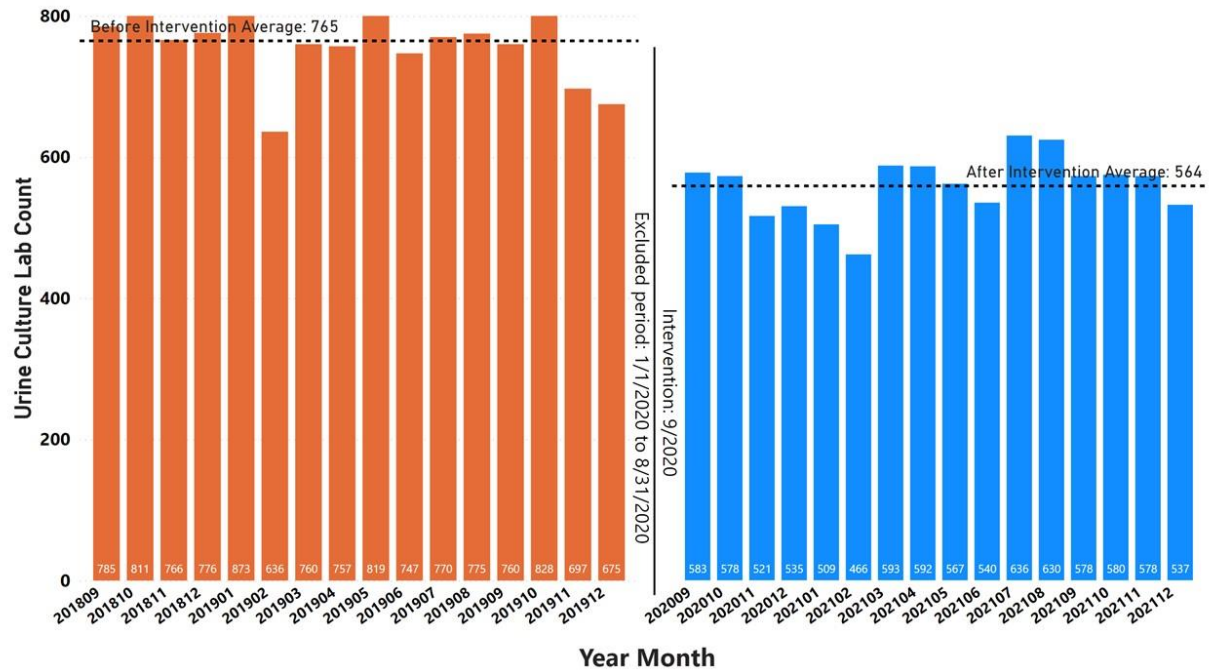


FIGURE 2. Urine culture lab count before and after urine culture clinical decision support menu intervention.

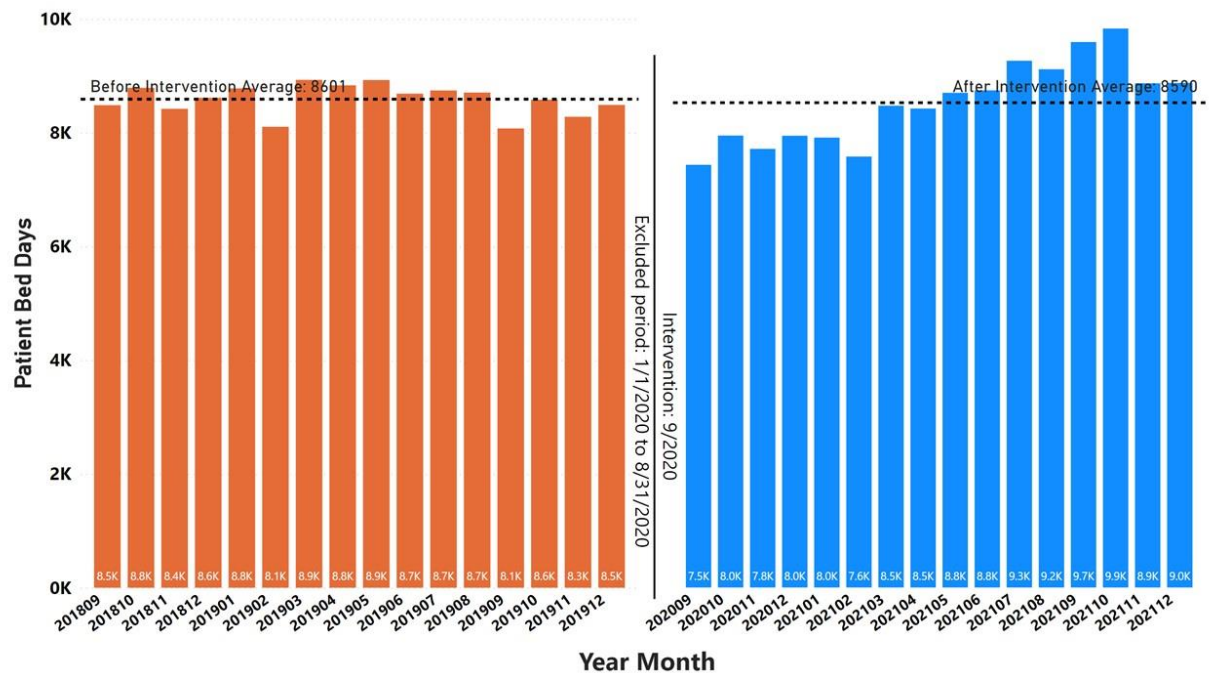


FIGURE 3. Patient bed days before and after urine culture clinical decision support menu intervention.

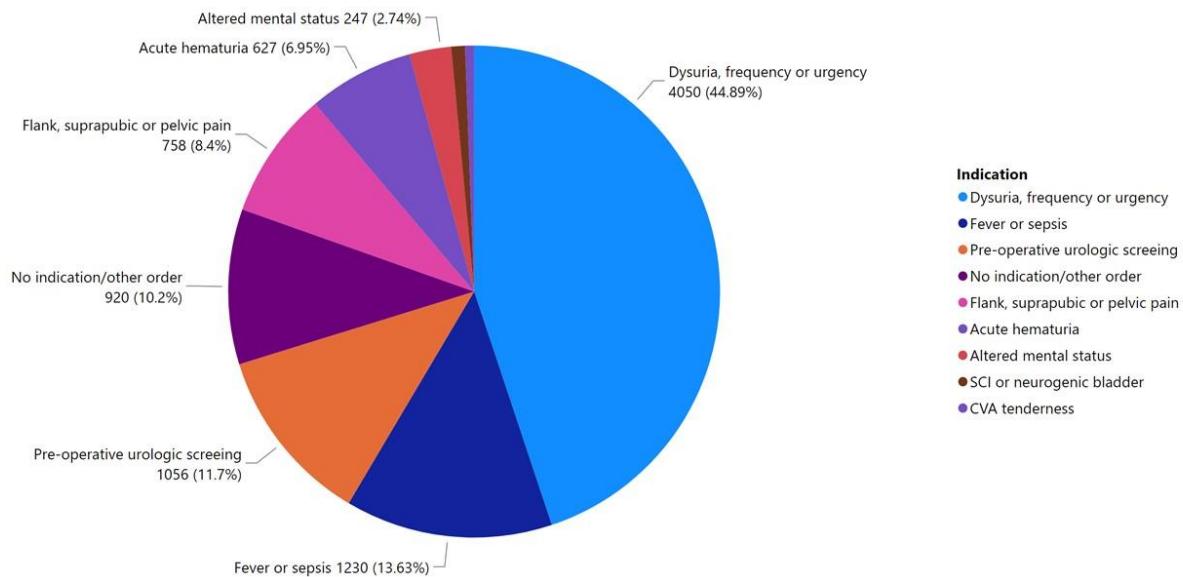


FIGURE 4. Urine culture orders by indication. Non-intervention labs are listed as no indication/other order.

References:

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2. Drekonja DM, Okoye NC, Kuskowski MA, Johnson JR. Appropriateness of urinary tract infection diagnosis and treatment duration. *Arch Intern Med* 2010;170(5):489-490
3. Drekonja DM, Gnadt C, Kuskowski MA, Johnson JR. Urine Cultures among hospitalized veterans: casting too broad a net? *Infect Control Hosp Epidemiol* 2014 May;35(5):574-6
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