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Addressing the "Culture of Culturing" in patients with asymptomatic bacteriuria

(Michigan Hospital Medicine Safety Consortium – Nov 2019)

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Mercy Health Saint Mary's Hospital

- Located in Grand Rapids, MI
  - Member of Trinity Health
  - 350-bed community teaching hospital

- Antimicrobial Stewardship Program
  - Began in October 2013
  - 1 Infectious Diseases pharmacist
  - 4 Infectious Diseases physicians
    - Stewardship champion
    - Infection control champion

Who Orders Urine Cultures?

- Emergency Department
  - > 85,000 visits per year
  - Majority of urinalysis and urine cultures
    - Reflex cultures
      - Criteria: >10 wbc/hpf **OR** +1 bacteria **OR** + 1 yeast
        - Males* > 3 wbc/hpf
- Critical Care
- Hospitalist, Internal Medicine, and Family Medicine
  - New orders often overnight and driven by calls from bedside staff

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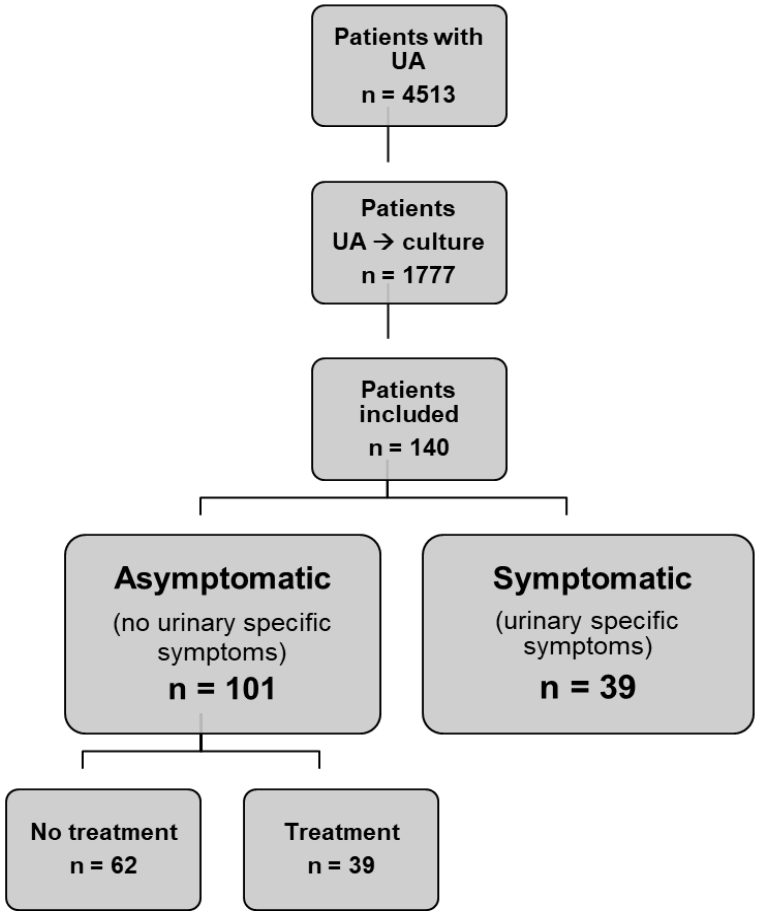
Initial Appropriate Orders of Critical Importance!

Continuation of Antibiotic Orders		
	Appropriate Antibiotic Inpatient	**p-value**
Appropriate Antibiotic in ED	82.5%	<0.001
Inappropriate Antibiotic in ED	18.8%	

Kulwicki B. Am J Emerg Med. 2018;37(5):839-844. doi: 10.1016/j.ajem.2018.07.052



	Symptomatic (n = 39)	Asymptomatic (n = 101)	P-value
Inpatient, mean length of therapy, (days)	3.9	3.8	0.832
Outpatient, prescribed mean length of therapy, (days)	4.8	2.2	0.038

Emergency Department Culturing

- Criteria-based urine cultures have been shown to decrease the number of urine cultures performed
  - Still do not take into account patient symptoms
  - Criteria for culture vary between institutions – less restrictive criteria result in more cultures
- At MHSM – reflex urine culture criteria resulted in treatment of ASB as well as increased incidence of CA-UTI

Uganski K et al. ID Week 2014. Poster #138

Point and Counterpoint Argument on Reflex Urine Cultures

- Major argument for reflex urine testing is that it will streamline testing and avoid antibiotics for patients with negative UA as well as save laboratory resources
  - This is true only if UA is being ordered on the majority of patients (point)
    - Recommend: set strict criteria with low threshold for contamination
  - May then ingrain in providers that the criteria used truly represent a UTI rather than symptoms and prompt prescribing for ASB (counterpoint)
    - Recommend: education and removal of reflex criteria, consider implementing ordering questionnaire/cascade

Humphries RM, Bard JD. J Clin Microbiol. 2016;54:254-58. doi:10.1128/JCM.03021-15.

Key Team Members to Improve Culturing

- Addressing over-culturing needs multidisciplinary action
  - Focused education and intervention:
    - Hospitalists
    - Family Medicine
    - **Emergency Medicine**
    - **Critical Care**
    - Oncology
    - Surgery
    - Pharmacy
    - **Infection Control**
    - Sepsis Team
    - **Front-line Nurses**
    - **Microbiology Laboratory**

Partnering with Infection Control

- CA-UTI concerns with over-culturing
  - Optimal partnership for improving culture ordering and collection
  - Partner with Microbiology Laboratory to adjust reflex culture criteria
    - Plan to move away from reflex cultures and focus on symptoms
    - Criteria changed to 10 wbc/hpf for all patients with epithelial cell rejection criteria
- Workgroup formed with nursing leaders from each floor including the Emergency Department
  - Removal of reflex urine culture order from provider and triage nursing order favorites
  - Guidelines developed for appropriate collection as well as an annual competency
- House-wide education

Symptom-Free Pee:
LET IT BE

STOP treating asymptomatic bacteriuria; it is not an infection.
STOP testing foul-smelling, dark, or cloudy urine.

WAIT and rehydrate patients who develop changes in mental status, behavior, or function without urinary tract infection symptoms.

GO to urinalysis and urine culture if typical signs and symptoms of urinary tract infection are present.

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Example of ASB Education to Teams

- Significant cause of inappropriate antibiotic use
  - May result in missed diagnoses
- **Avoid** reflex urine culturing
- **Avoid** stating "asymptomatic, patient will be called if culture is positive"
  - Urinalysis unreliable in the absence of symptoms
- Treat and culture only when symptoms of UTI: dysuria, frequency, suprapubic pain, flank pain, fever
  - New guidelines from IDSA address elderly patients and those with altered mental status:
    - Avoid antibiotics/"Watch and Wait"

Michigan Hospital and Medication Safety Consortium Data

ASB- Urine Culture Order By Emergency Medicine Overtime- Mercy Health St. Mary's

Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019
77.8%	78.6%	100%	80%	50%	73%	**56%**

Audit and Feedback

- Give feedback on culturing to providers
  - Positive feedback and trends speak loudly
  - Helps to catch new providers as well
    - High turn-over in the ED
- ED pharmacists (“Dream team”)
  - Feedback at the time of ordering
    - Discourage culturing and treatment of ASB
    - Question order “favorites” and reflex cultures

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Treatment Rates of Asymptomatic Bacteriuria

- ED: 2010 vs. 2014 vs. 2016

	Pre-EMP/ASP (n=50)	Early-EMP/ASP (n=50)	Established-EMP/ASP (n=50)	p-value
Treatment of ASB, n (%)	36 (72)	19 (38)	23 (46)	0.002

Next Steps to Reduce Culturing and Treatment of ASB

- Moving to new EHR in 2020
  - Order cascading with prompts to encourage appropriate ordering of urine cultures?
- Continued consistent education to staff surrounding ASB testing and treatment
  - Audit and feedback

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