Asymptomatic Bacteriuria:

Tips and Tricks to Reduce the Urge to Treat

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OVERVIEW

Scope of the problem

Mental models that lead to over-testing

Sociobehavioral strategies and nudges

Applying these strategies to Asymptomatic Bacteriuria

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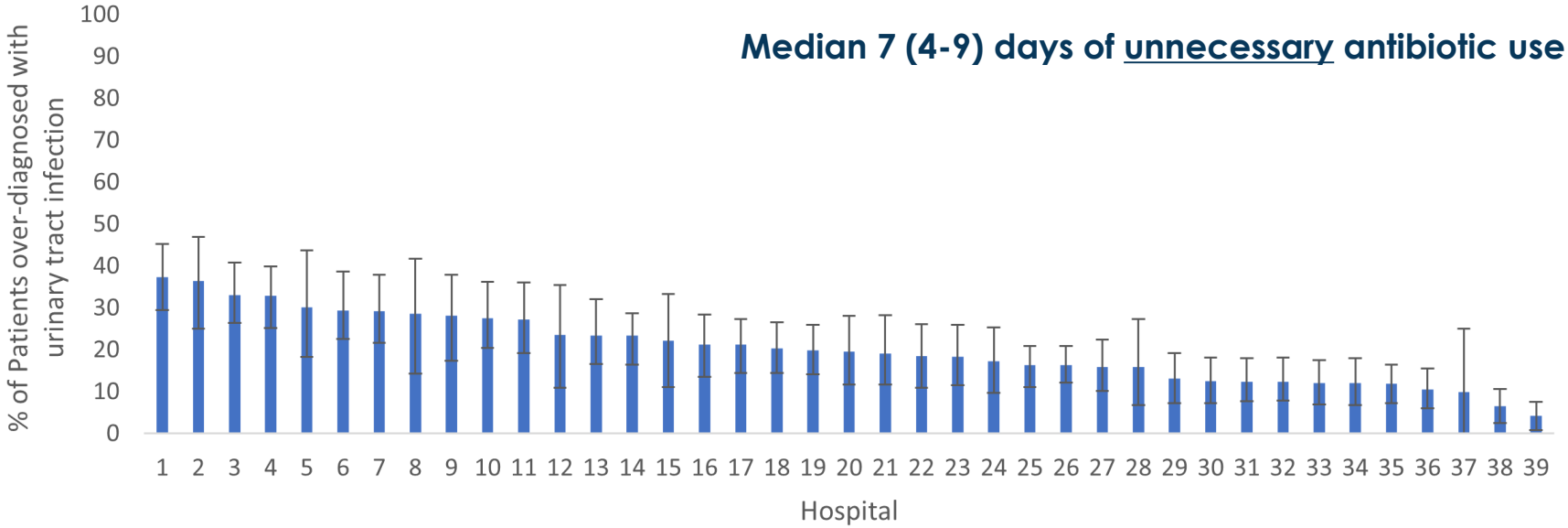
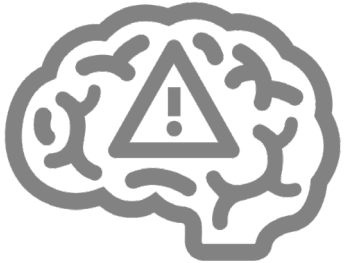
Patients Treated for UTI that Actually Have ASB



Risk Factors for Treatment of Asymptomatic Bacteriuria in Hospitalized Patients: **2733 patients, 46 hospitals**

Age
OR 1.1/10 years



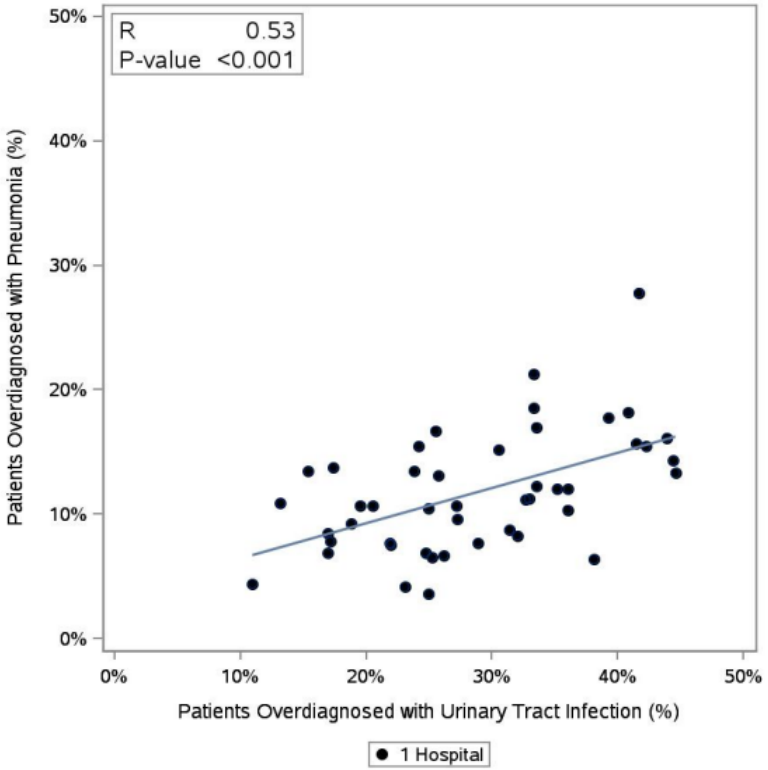
Dementia
OR 1.6

Incontinence
OR 1.8

Altered
OR 1.9

Petty LA, Vaughn VM et al. *JAMA Internal Medicine.*

Over-diagnosis of PNA is Associated with Over-diagnosis of UTI



Gupta A…Vaughn VM, *BMJ Quality & Safety. 2022*

Outcomes Associated with Treatment of Asymptomatic Bacteriuria in Hospitalized Patients: **2733 patients, 46 hospitals**

Treatment of ASB was associated with longer duration of hospitalization after urine testing (3→4 days)

Treatment did not reduce mortality, readmissions, ED visits

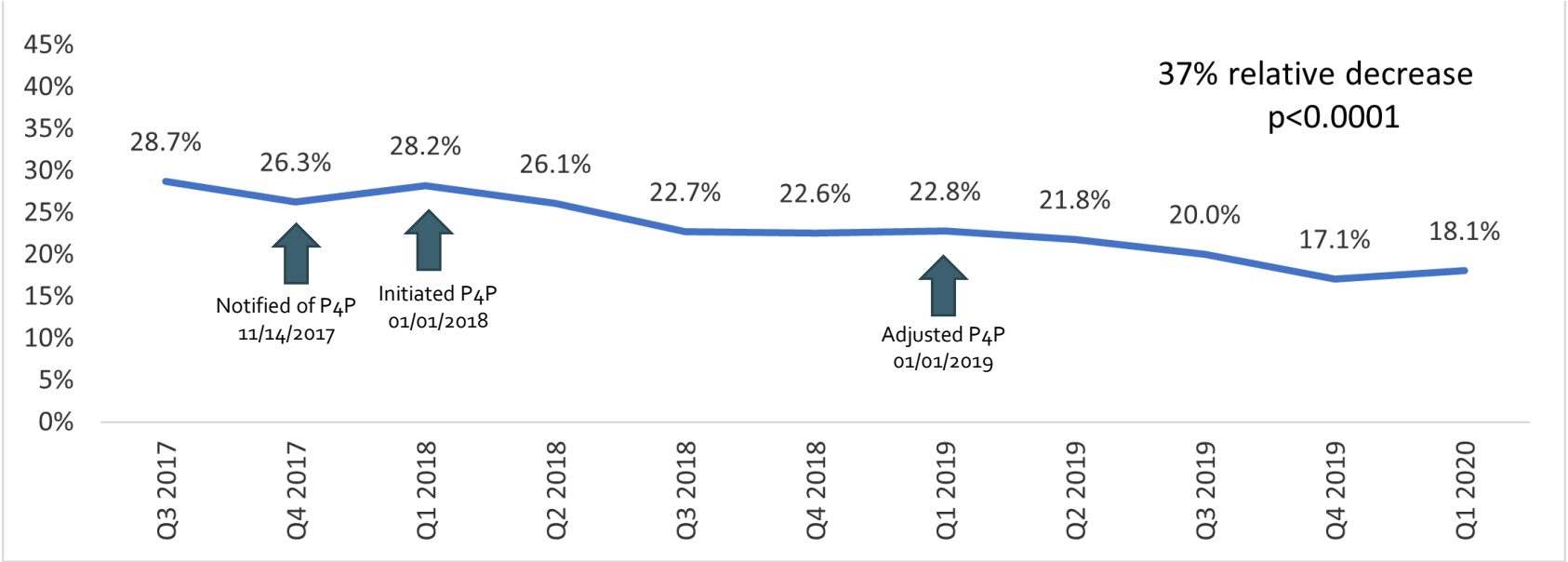
Petty LA, Vaughn VM et al. *JAMA Internal Medicine.*

Diagnostic stewardship vs. Antibiotic stewardship?

Reducing use of inappropriate urine cultures

Reducing treatment of asymptomatic patients with positive urine cultures

Quarterly Percentage: Patients Treated for UTI that Actually Have ASB



Pearl #1

80% of reduction of unnecessary antibiotic use was due to decrease in inappropriate urine testing

Pearl #2

ASB diagnostic stewardship *has*to **start in the ED**

ED clinicians order 80% of urine cultures in patients with ASB treated with antibiotics and initiate antibiotic therapy in 69%

Over 80% of patients with ASB started on antibiotics by an ED clinician remain on antibiotics on day 3 of hospitalization. (diagnostic momentum)

Petty LA, Vaughn VM, et al. *OFID*. 2020; Gupta A… Vaughn VM. *BMJ Q&S*. 2022.

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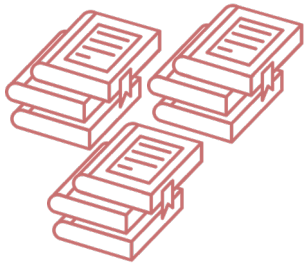
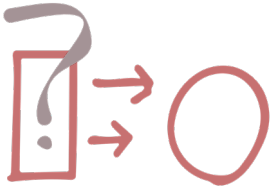
Three mental models that lead to over-testing

Reflexive Testing



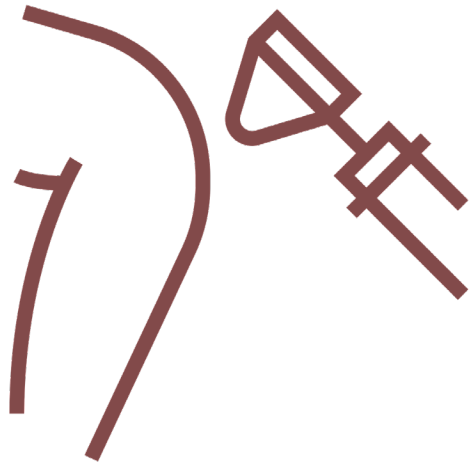
More Data→More Comfort



Misunderstanding Normal vs. Abnormal

Vaughn, Szymczak, Newton, Fakih. Annals of Internal Medicine. 2019.

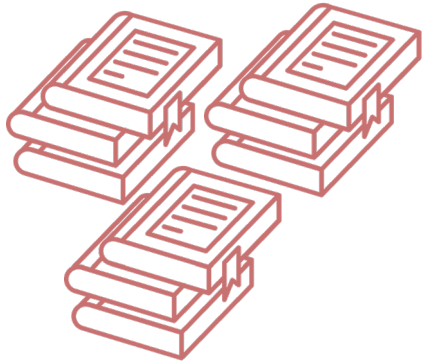
Reflexive Testing



Habitual testing

- Disease
- Symptoms
- Circumstance (e.g., pre-op, upon arrival to ED)

More Data→More Comfort

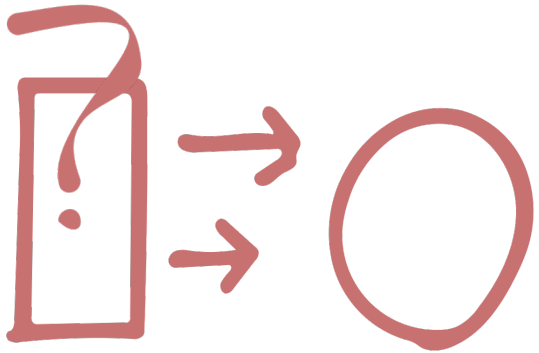


"Just in case" testing

Jeff visits the doctor for his runny nose.

You're probably fine. But just to be on the safe side, let's get a CT scan, MRI, and 18 tubes of bloodwork

Misunderstanding Normal vs. Abnormal



Diagnostic testing for normal “symptoms”

"The patient's urine is dark and **smelly**, so I went ahead and sent a urine culture"

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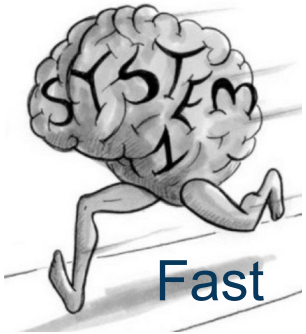
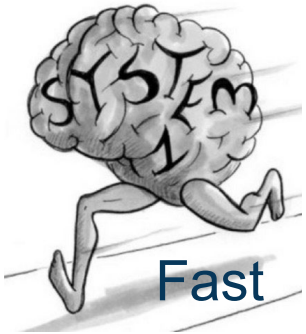


Reflexes
Gut reactions
Habits

Daniel Kahneman. Thinking Fast and Slow. 2011



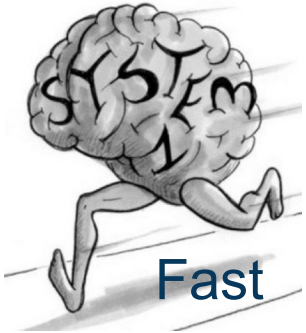
Reflexes
Gut reactions
Habits

Prone to
cognitive biases
(often repetitive,
predictable)

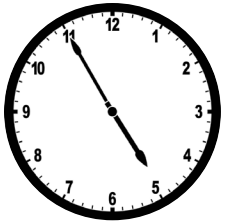
Daniel Kahneman. Thinking Fast and Slow. 2011

Deliberating
Weighing options

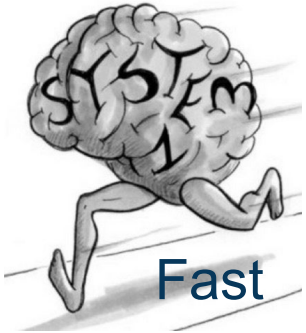
Cognitively burdensome



Poor attention (Multi-tasking)
Time pressure
High stress
Fatigue



Linder JA. JAMA Intern Med. 2015.



Reflexes
Gut reactions
Habits

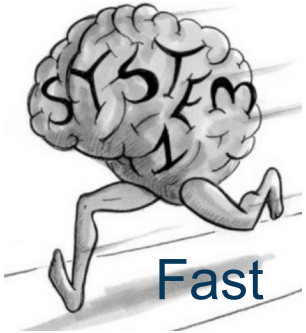
Prone to cognitive biases
(often repetitive, predictable)

Take advantage of these biases--
"nudging"
"choice architecture"

Vaughn VM, Linder JA. BMJ Quality & Safety. 2018

"Any aspect of the choice architecture that alters people's behavior in a **predictable** way **without forbidding any options** or significantly changing their economic incentives"

Richard Thaler. Nobel Prize in Economics 2017



Sociobehavioral strategies

Change the social norms to influence choice

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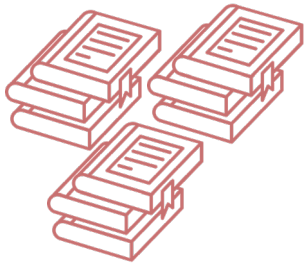

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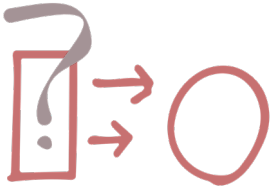

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Reflexive Testing

Vaughn, Szymczak, Newton, Fakih. Annals of Internal Medicine. 2019.

Sociobehavioral

Avoid ordering diagnostic tests *before* examining patients

Less efficient

Szymczak J et al. J Health Soc Behav. 2012

Nudge

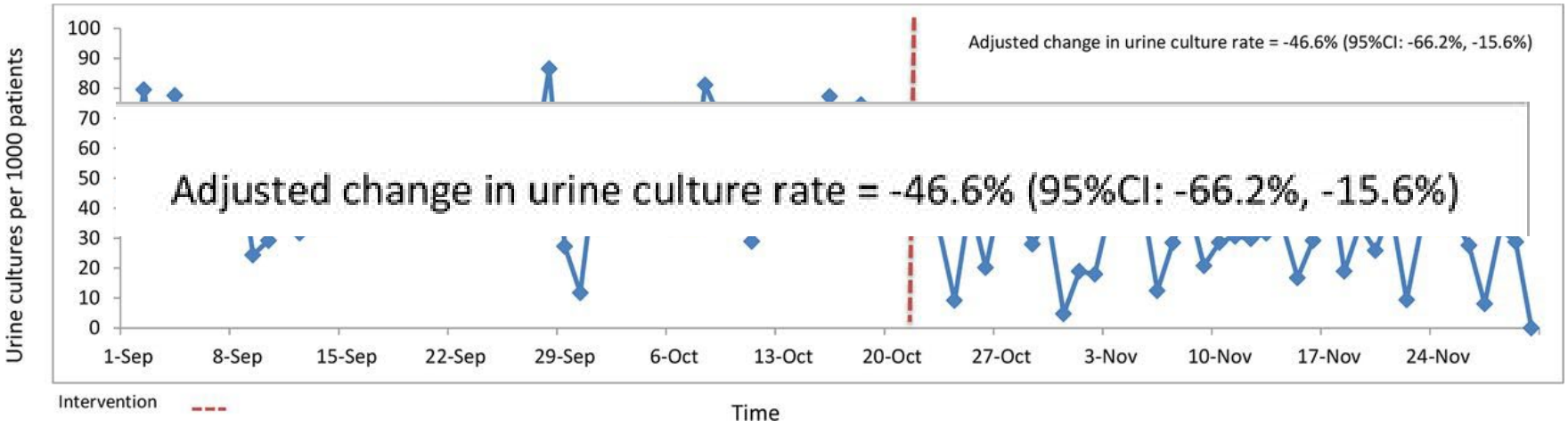
Remove urine cultures from admission or ED ordersets.
(ordering is no longer automatic, thus requires MORE effort to order)

Impact of order set design on urine culturing practices at an academic medical centre emergency department

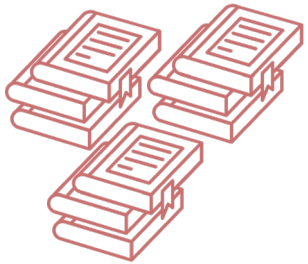
BMJ Quality & Safety

‘Urinalysis with reflex to microscopy’

All other urine tests required additional mouse clicks



Munigala S et al. BMJ Q&S. 2017



More
Data→More
Comfort

Sociobehavioral

Practice, teach, and encourage mindful diagnostic testing

AJM online
Brief observation

Mindfulness-Based Laboratory Reduction: Reducing Utilization Through Trainee-Led Daily 'Time Outs'

THE AMERICAN JOURNAL of MEDICINE®

"Afternoon sign-out was modified to include a "time out" briefly addressing any required laboratory testing for the following day. Junior residents and medical students would propose tests to the senior residents and faculty who would, in turn discuss both value and necessity."

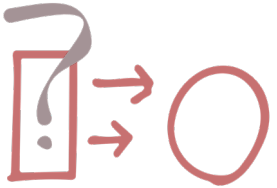
10
fewer tests per patient (25→15)

32%
reduction in per-patient cost

$50,657
estimated savings

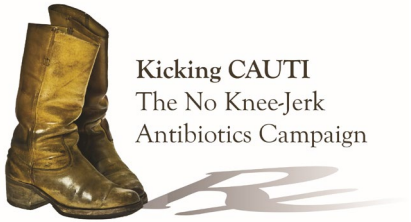
Nudge

No urine cultures with negative UAs



Misunderstanding Normal vs. Abnormal

Kicking CAUTI
The No Knee-Jerk Antibiotics Campaign



Kicking CAUTI
The No Knee-Jerk
Antibiotics Campaign

Fast and frugal algorithm

Pyuria, cloudy urine, and foul smell are not symptoms of UTI

Urine cultures in patients with catheters decreased by nearly 50%, overtreatment of catheter-associated ASB fell by nearly two-thirds

Trautner BW et al. JAMA Intern Med. 2015.

Nudge

Hiding urine culture results in non-catheterized patients.

BRIEF REPORT

CID 2014:58 (1 April)

Reducing Antimicrobial Therapy for Asymptomatic Bacteriuria Among Noncatheterized Inpatients: A Proof-of-Concept Study

Jerome A. Leis,[1,2] Gabriel W. Rebick,[1] Nick Daneman,[1] Wayne L. Gold,[1] Susan M. Poutanen,[1,3,4] Pauline Lo,[3] Michael Larocque,[3] Kaveh G. Shojania,[2] and Allison McGeer[1,3,4]

[1]Division of Infectious Diseases, Department of Medicine, University of Toronto; [2]Department of Medicine, University of Toronto Centre for Quality Improvement and Patient Safety; [3]Department of Microbiology, University Health Network/Mount Sinai Hospital, Toronto; and [4]Division of Medical Microbiology, Department of Laboratory Medicine and Pathobiology, University of Toronto, Ontario, Canada

Positive Urine Culture

Reflex

Antibiotic Use

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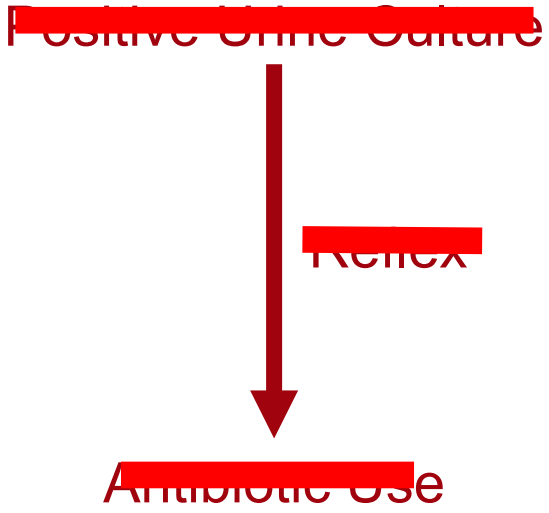


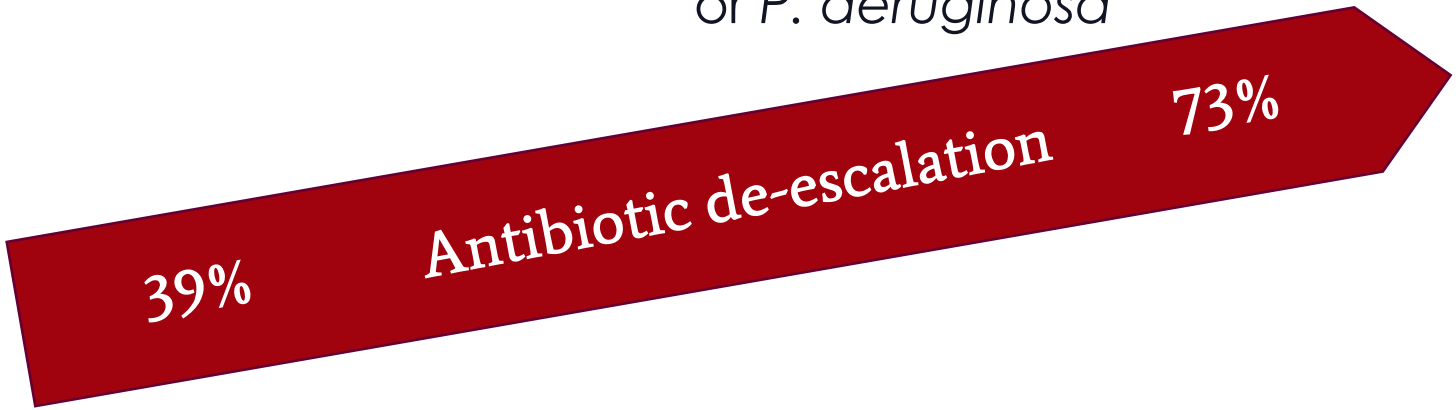
"The majority of positive urine cultures from inpatients without an indwelling urinary catheter represent asymptomatic bacteriuria. If you strongly suspect that your patient has developed a urinary tract infection, please call the microbiology laboratory."

Rates of antibiotic treatment for asymptomatic bacteriuria fell from 48% to 12%

Nudge

Framing culture results.

commensal respiratory flora → commensal respiratory flora only: No *S. aureus*/MRSA or *P. aeruginosa*



Musgrove, OFID, 2018.

Practical Takeaways

Antibiotic treatment in asymptomatic bacteriuria associated with longer length of stay → *leadership*

Diagnostic stewardship is critical for ASB

Diagnostic stewardship HAS to involve the ED

Sociobehavioral Strategies and Nudges:

Remove cultures from ordersets, frame test results, implement diagnostic timeouts, use algorithms, maybe reflex cultures

Questions?

Keep In Touch!

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