Leveraging microbiology nudges to promote antimicrobial stewardship in acute care settings

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BACKGROUND

- Microbiology comments, or "nudges", are efficient, effective, and sustainable stewardship interventions that can be reproduced in most settings
- By strategically reporting microbiology results while maintaining prescriber autonomy, nudging strategies within the electronic medical record are effective in improving antimicrobial use

OBJECTIVE

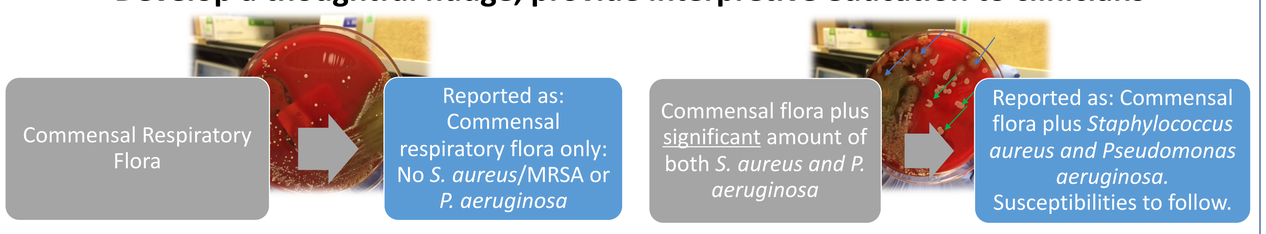
- To describe three best practice examples of developing purposeful microbiology nudges that improve antimicrobial prescribing in acute care settings

CRAFTING A THOUGHTFUL NUDGE

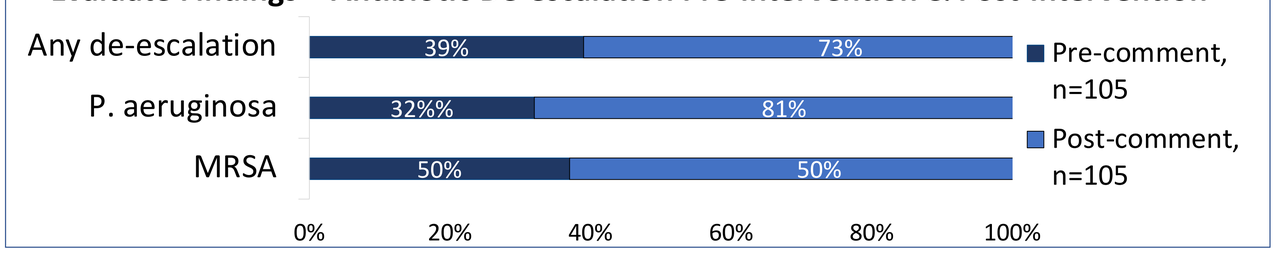
Where could a nudge be useful to improve patient care? What internal data do you have?

Example 1. *"Appropriate de-escalation of antibiotic therapy for pneumonia is best practice, but prescribers often fail to act on cultures reported as commensal flora or misinterpret such results."*

Develop a thoughtful nudge, provide interpretive education to clinicians



Evaluate Findings – Antibiotic De-escalation Pre-intervention & Post-Intervention



RESULTS

Example 2. Another Respiratory Culture Nudge Improves Pneumonia Prescribing

Antibiotic Prescribing in *H. influenzae* and *M. catarrhalis*

Organism	β-lactamase Result	Suboptimal De-escalation
H. influenzae	Positive, *n*=5	25%
H. Influenzae	Negative, *n*=13	0%
M. catarrhalis	Positive, *n*=12	33%

Pre-comment

Susceptibility

Moraxella catarrhalis

Antibiotic	Interpretation	Value	Method
Beta Lactamase	**Resistant**	Positive	BLC (BETA LACTAMASE)

Haemophilus influenzae

Antibiotic	Interpretation	Value	Method
Beta Lactamase	**Susceptible**	Negative	BLC (BETA LACTAMASE)

Post-comment

Susceptibility

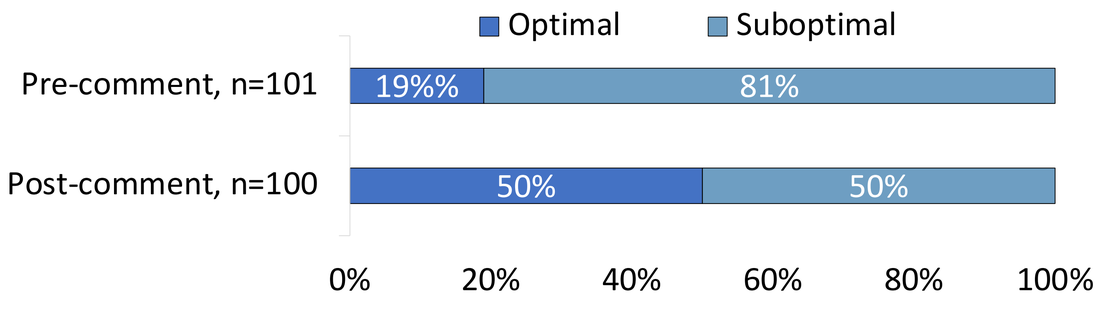
Haemophilus influenzae

Antibiotic	Interpretation	Value	Method
Beta Lactamase	**Resistant**	Positive	BLC (BETA LACTAMASE)
Beta Lactamase		This organism is predictably susceptible to Ampicillin/Sulbactam IV or Amoxicillin/Clavulanate oral.	BLC (BETA LACTAMASE)

Moraxella catarrhalis

Antibiotic	Interpretation	Value	Method
Beta Lactamase	**Resistant**	Positive	BLC (BETA LACTAMASE)
Beta Lactamase		This organism is predictably susceptible to Ampicillin/Sulbactam IV or Amoxicillin/Clavulanate oral.	BLC (BETA LACTAMASE)

Optimal Antibiotic De-escalation



Example 3. Appending a Blood Culture Nudge to Rapid PCR Results Improves Prescribing in Low- and No-risk AmpC Enterobacterales

- We aimed to change prescribing practices for treatment of no/low risk AmpC Enterobacterales across Henry Ford Health hospitals to use narrower spectrum therapy vs. cefepime/carbapenems and achieve the same patient outcomes

Eliminated an AmpC comment in the electronic medical record microbiology report for low/no risk organisms: *Citrobacter koseri*, *Citrobacter amalonaticus*, *Serratia marcescens*, *Morganella morganii*, and *Providencia* species (22 March 2022)

Revised Tier 1: Rapid blood polymerase chain reaction (PCR) identification guideline and modified BioFire® Blood Culture Identification (BCID2) Panel PCR microbiology comment for *Serratia marcescens* recommending ceftriaxone as the treatment of choice (29 June 2022)

Developed a one-page guidance document and provided education in person and electronically for pharmacists and prescribers (2nd quarter 2022)

***Serratia marcescens* microbiology comment before intervention:**

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!
Anaerobic bottle Serratia marcescens Susceptibility to follow Presumed AmpC
beta-lactamase producer.  Drugs of choice = Cefepime or Ertapenem.
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***Serratia marcescens* microbiology comment after intervention:**

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Aerobic bottle Serratia marcescens Susceptibility to follow Drug of choice = Ceftriaxone !
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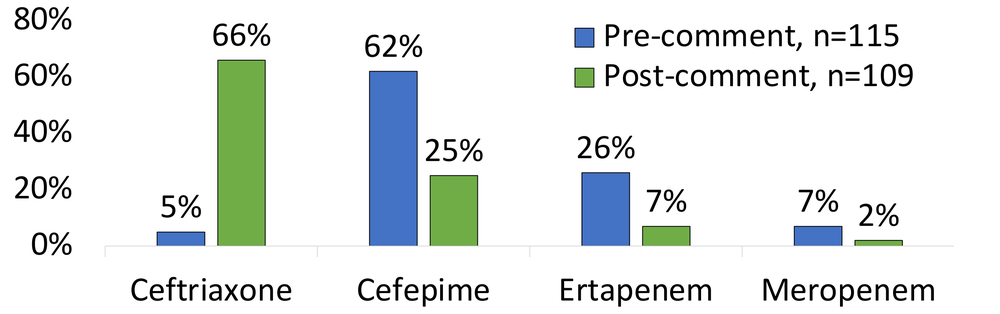
Definitive Antibiotic Treatment for low/no risk AmpC Enterobacterales



SUMMARY

- Nudge success relies on collaborative efforts among microbiology and antimicrobial stewardship personnel
- Nudge roll-out should include i) clinician education, ii) policy change and/or end-user buy-in, and iii) formal evaluation for effectiveness
- Future Henry Ford Health nudge directions include i) appending "therapy of choice" antibiotic recommendations based on BIOFIRE® Blood Culture Identification (BCID2) Panel panel results and ii) recommending no antibiotic treatment for common colonizing bacteria

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