



The effect of nudge intervention on procalcitonin-guided antibiotic de-escalation in patients with respiratory infections

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Background

- Evidence based procalcitonin algorithms recommend discontinuation of antibiotics at values < 0.25 ng/mL for lower respiratory tract infections
- A retrospective study conducted at our academic center in 2021 demonstrated treatment was continued despite a low PCT value in 80.4% of patients on antibiotics
- We examined the impact of a nudge intervention on clinicians' decision to de-escalate antibiotics in patients with a low procalcitonin value

Methods

CONTROL (June-July 2023)

- A retrospective analysis was performed on patients with procalcitonin values < 0.25 ng/mL
- Patients were included for comparison to patients in the intervention group if they met inclusion criteria and did not meet exclusion criteria

INTERVENTION (August-December 2023)

- We used a dynamic EPIC procalcitonin report that consisted of patients who have met our inclusion criteria (Figure A)
- 1st call providers for eligible patients were contacted via EPIC Secure Chat with a standardized message suggesting antibiotic de-escalation if clinically appropriate

OUTCOMES

- We compared the following between the two groups:
 - Mean antibiotic duration
 - Mean time from procalcitonin result to antibiotic de-escalation

Methods

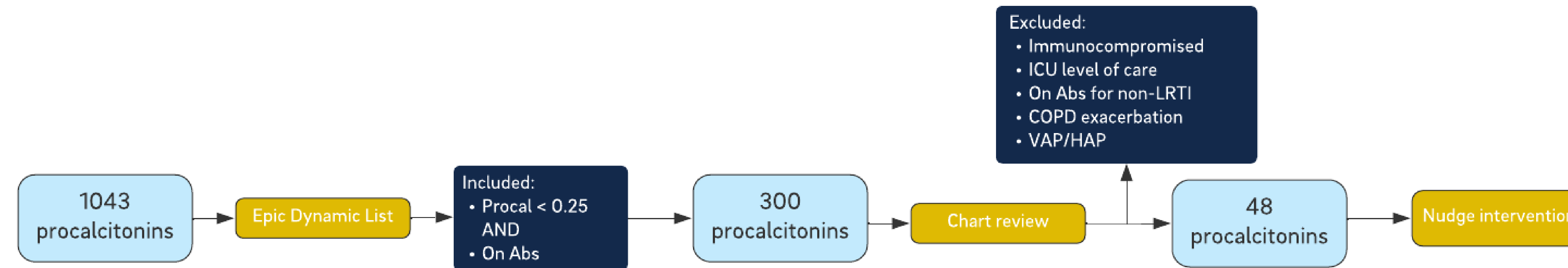
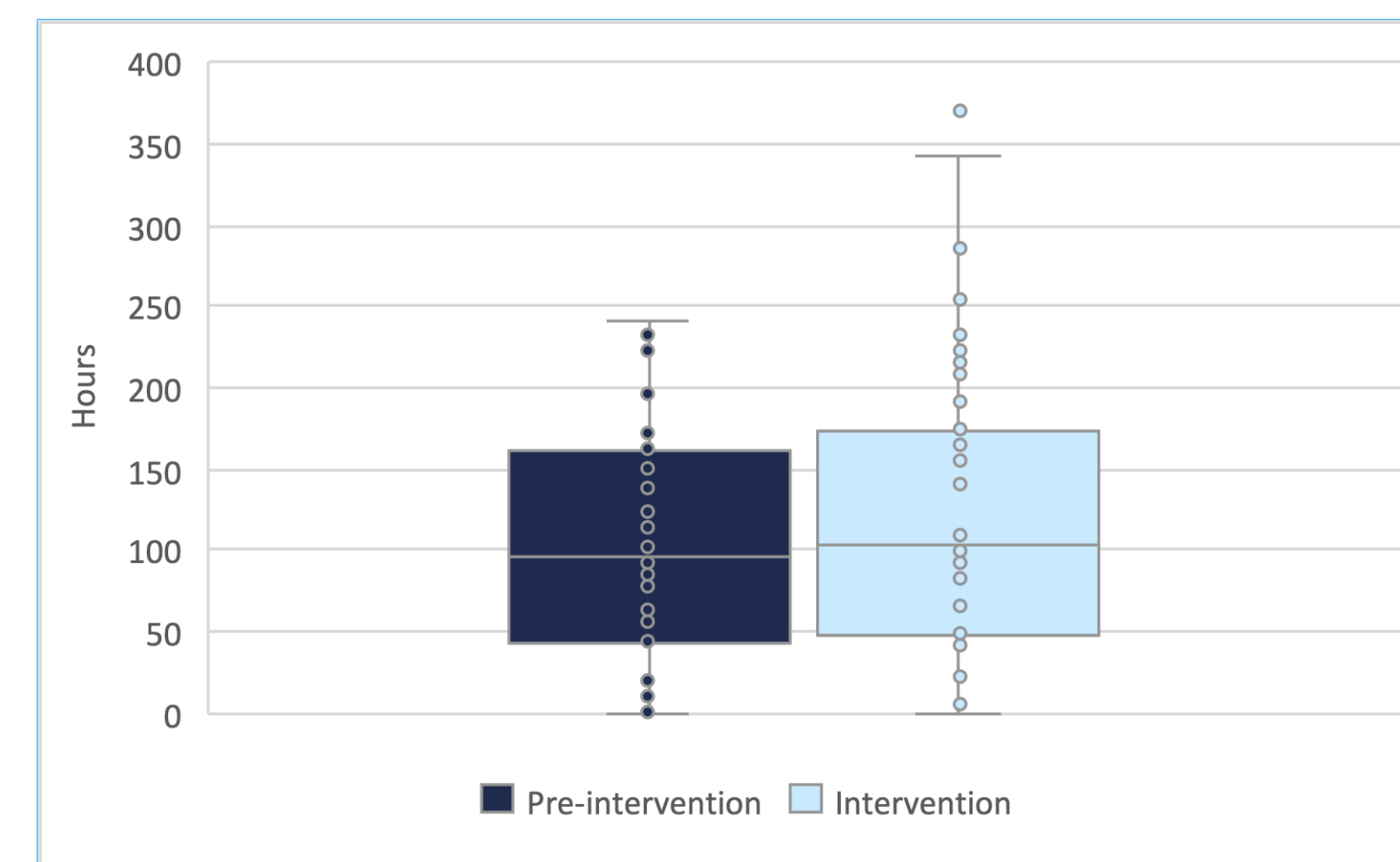


Figure A: Algorithm for determining intervention group

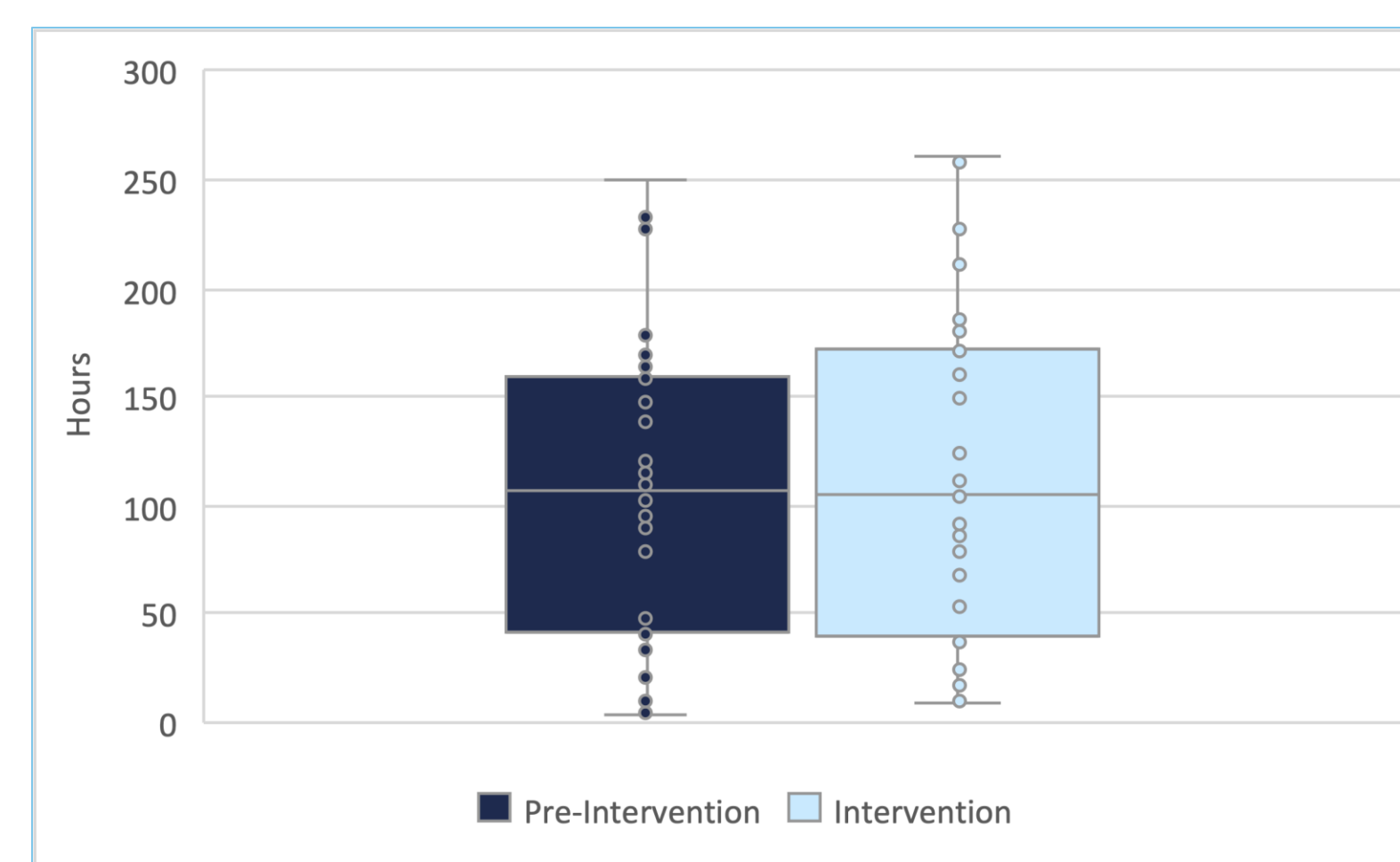
Results

Figure B: Mean antibiotic duration



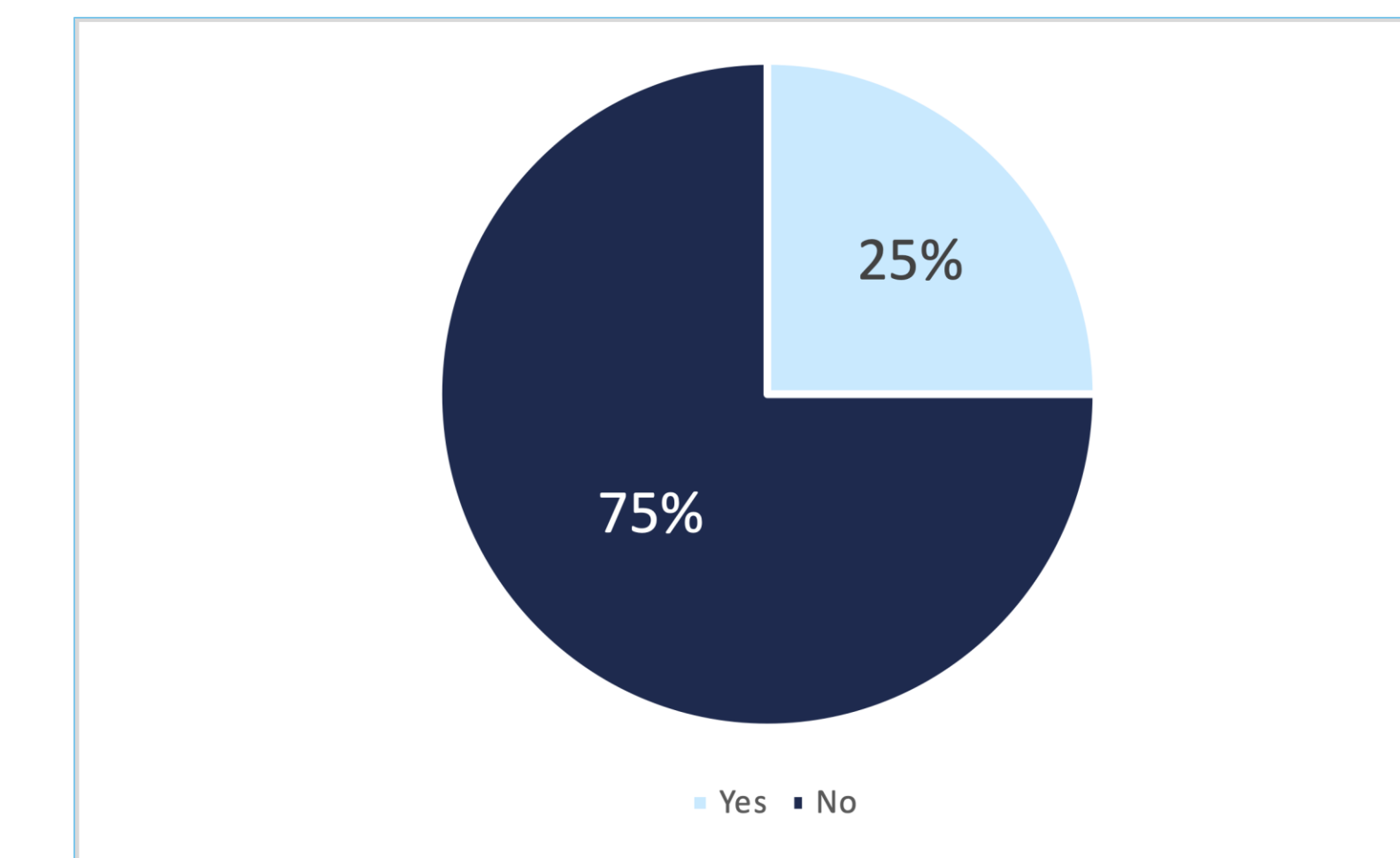
Mean antibiotic duration (in hours) was 105.84 hours and 123.24 hours for the control group and intervention group respectively, $p=0.29$ (Figure B)

Figure C: Time from procalcitonin result to antibiotic de-escalation



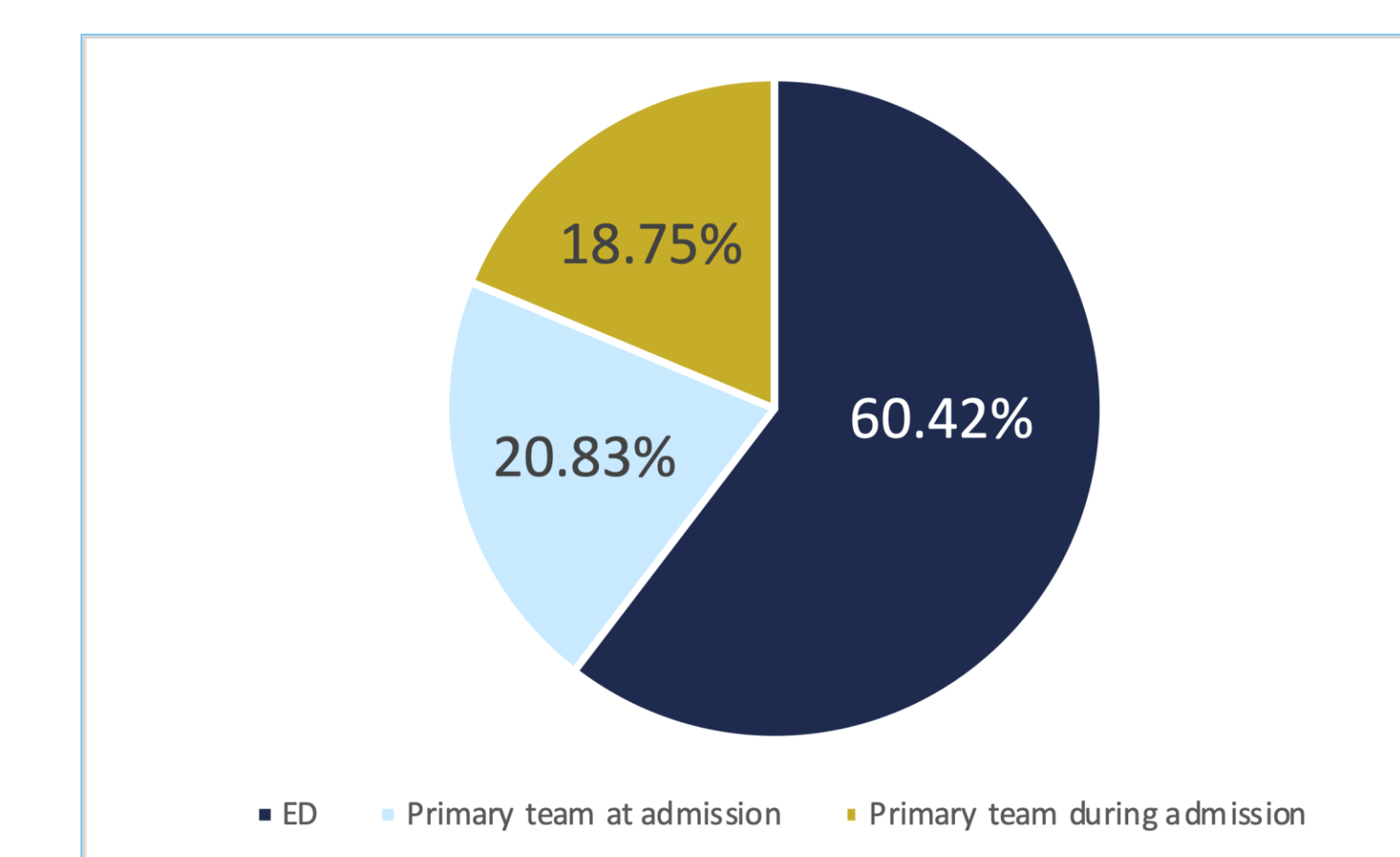
Mean time from procalcitonin result to antibiotic de-escalation (in hours) was 105.85 hours and 108.15 hours for the control group and intervention group respectively, $p=0.87$ (Figure C)

Figure D: Antibiotic de-escalation within 24 hours of nudge intervention



For the intervention group, 25% of providers de-escalated antibiotics within 24 hours of the nudge intervention (Figure D)

Figure E: Procalcitonin classified by ordering service



Procalcitonin levels were ordered by the ED provider 60.42% of the time, by the primary team at admission 20.83% of the time, and by the primary team during admission 18.75% of the time (Figure E)

Conclusion

- Nudge interventions did not change clinician decision making regarding procalcitonin-guided antibiotic de-escalation, when evaluating mean antibiotic duration or time from procalcitonin result to antibiotic de-escalation
- Lack of improvement following a nudge implies that knowledge gaps do not explain discordance between testing and antibiotic prescribing.
- Despite high utilization of the procalcitonin assay at our institution, results rarely impact clinical decision-making
- The utility of procalcitonin as a tool for antibiotic stewardship, absent more effective decision support, is questionable

Future Directions

- Guidance at the point-of-care through indication-based ordering protocols or other forms of restricted usage

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