Comparison of Traditional Stool Culture and Targeted Testing Using Multiplex PCR to Diagnose Infectious Diarrhea at the Atlanta VA Medical Center (AVAMC): A Diagnostic Stewardship Initiative.

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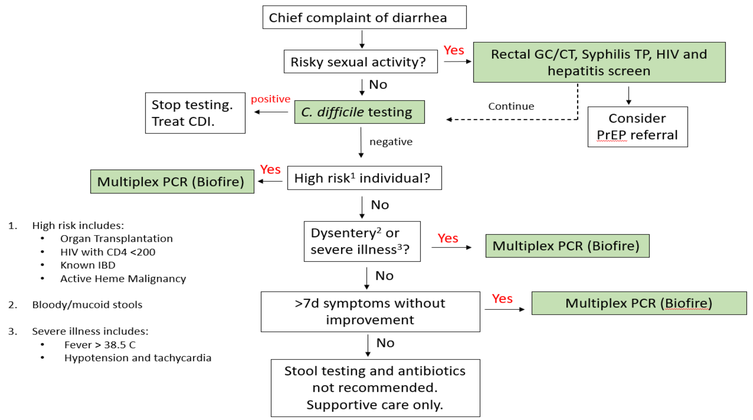
INTRODUCTION

- In March 2022, multiplex PCR testing (Biofire® FilmArray® GI panel) was initiated at AVAMC.
- To optimize laboratory workflow and improve diagnostic stewardship, a targeted algorithm was developed to optimize diagnostic stool testing.
- The targeted algorithm was retroactively applied to historical stool cultures to assess the impact on diagnosis, inappropriate test ordering, and cost.

METHOD

- Identified patients with bacterial stool cultures and *Campylobacter* antigen tests from Jan. 1, 2019 to Dec. 31, 2021.
- Reviewed clinical information among patients with a positive stool culture and a random sample of patients with a negative culture.
- Applied targeted algorithm to both cohorts to evaluate missed cases, outcomes, and overall differences in costs and labor between traditional stool cultures and targeted multiplex PCR testing.

Figure 1: Targeted Algorithm for Testing Infectious Diarrhea (available via QR code)



A targeted algorithm for testing infectious diarrhea could reduce unnecessary stool testing by 75% at the Atlanta VAMC.

This reduction could save an estimated $50,000 and 750 laboratory labor hours over a two-year period.

RESULTS

- 127 total cases reviewed (100 neg; 27 pos)
- Using the algorithm, targeted algorithm excluded testing of 75% of negative stool cultures but missed diagnosis in 22% of positive stool cultures.
- Supplementary results available via QR code

Table 1: Characterization of stool culture results by positive or negative status

Stool Culture Trends Observed	Positive Test Results N=27	Negative Test Results N=100
Inpatient (%)	15 (56)	48 (48)
Outpatient (%)	12 (44)	52 (52)
Average days of symptoms Prior to Testing	6.6	25.7
Not included for testing by algorithm (%)	6 (22)	75 (75)
Presented with severe features (%)	17 (63)	16 (16)
High-risk patients (%)	6 (22)	14 (14)
Received supportive care only (%)	8 (30)	77 (77)
Recovered within 14 days (%)	27 (100)	100 (100)

DISCUSSION

- Bacterial stool culture is a high-cost, low-yield test that is frequently over-utilized outside of guideline recommended clinical indications.
- Multiplex PCR materials costs would likely be higher than culture costs, but time cost (cultures estimated to require 1-hour additional tech time) and limiting of test use produces a projected net savings.
- Time to results (>24 vs 48-72 hrs.) for PCR can lead to quicker changes in treatment (I.E., D/C abx).
- Algorithm-guided testing would capture the majority of bacterial diarrhea at AVAMC but could lead to missed diagnoses in lower-risk populations.