Development and implementation of a 2-tier testing algorithm for *Clostridioides difficile*:
An evaluation of outcomes on patients with indeterminate results at 90 days.

Johanna Brown, MD and Stephanie Puckett, PharmD, BCPS

johanna@idvirginia.com ph4349473900
stephanie.puckett@centrahealth.com fax4345442323

CENTRA

INTRODUCTION

- To date, there is no definitive gold standard for accurate diagnosis of *Clostridioides difficile (C difficile)* infection.
- Relying solely on a molecular test such as polymerase chain reaction (PCR) for diagnosis, can lead to over diagnosis and unnecessary treatment.
- Multi-step algorithms have been proposed to improve specificity of testing, but the challenge remains in interpreting discordant or indeterminate results.
- The extent of risk for hospitalization due to lack of treatment for indeterminate results remains unclear.

PURPOSE

To evaluate a new combined approach to improve *C difficile* testing and treatment for patients in our hospitals, affiliated clinics and skilled care facilities:

- Creation of a new *C difficile* 2 tier testing algorithm
- Educational information was presented to all hospitalists, clinical pharmacists, laboratory staff, and posted on the hospital intranet for reference.
- Development of a *C difficile* testing advisor within the Electronic health Record (EHR) for inpatient use
- Creation of a *C difficile* treatment pathway into the EHR based on most recent IDSA guidelines
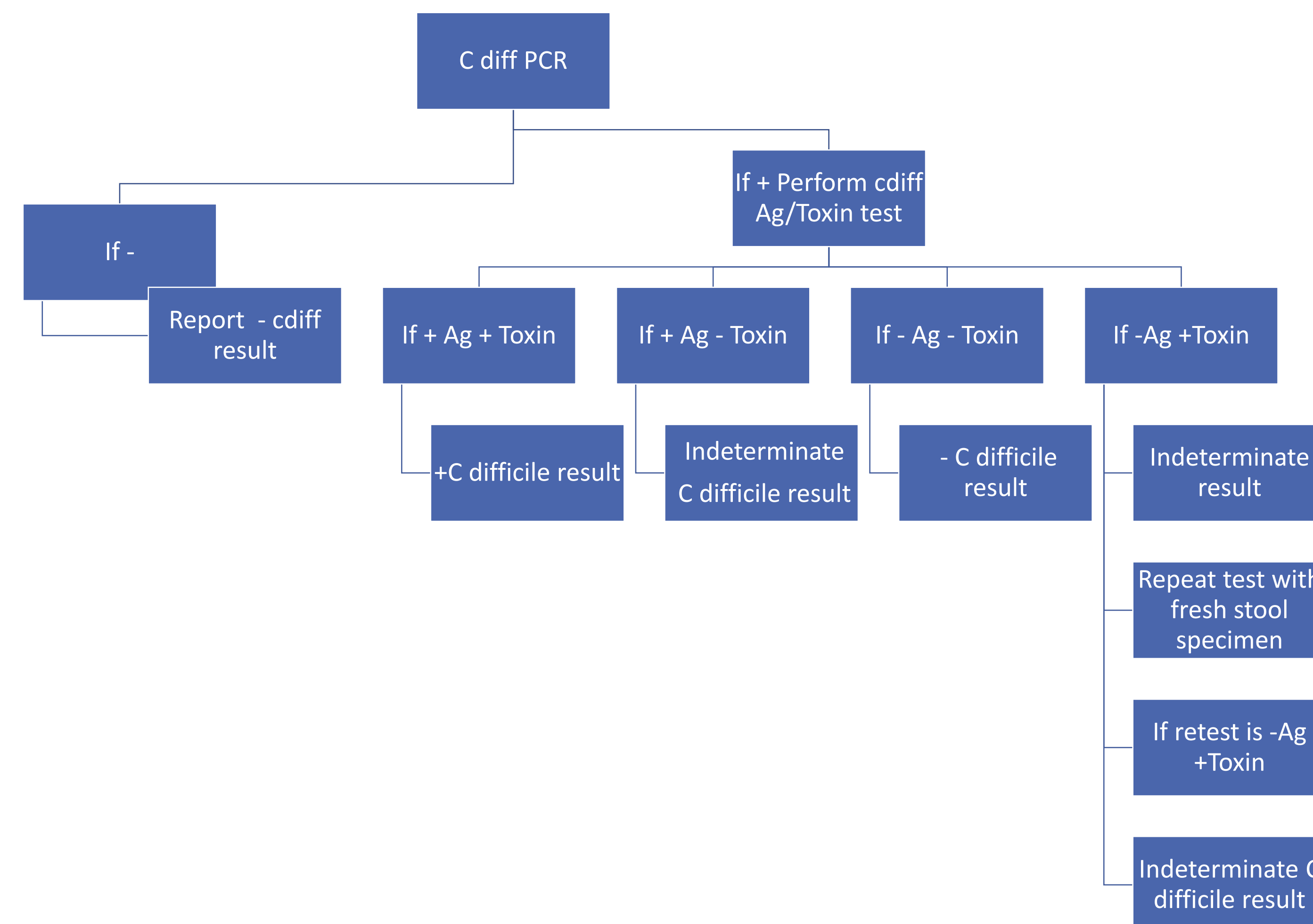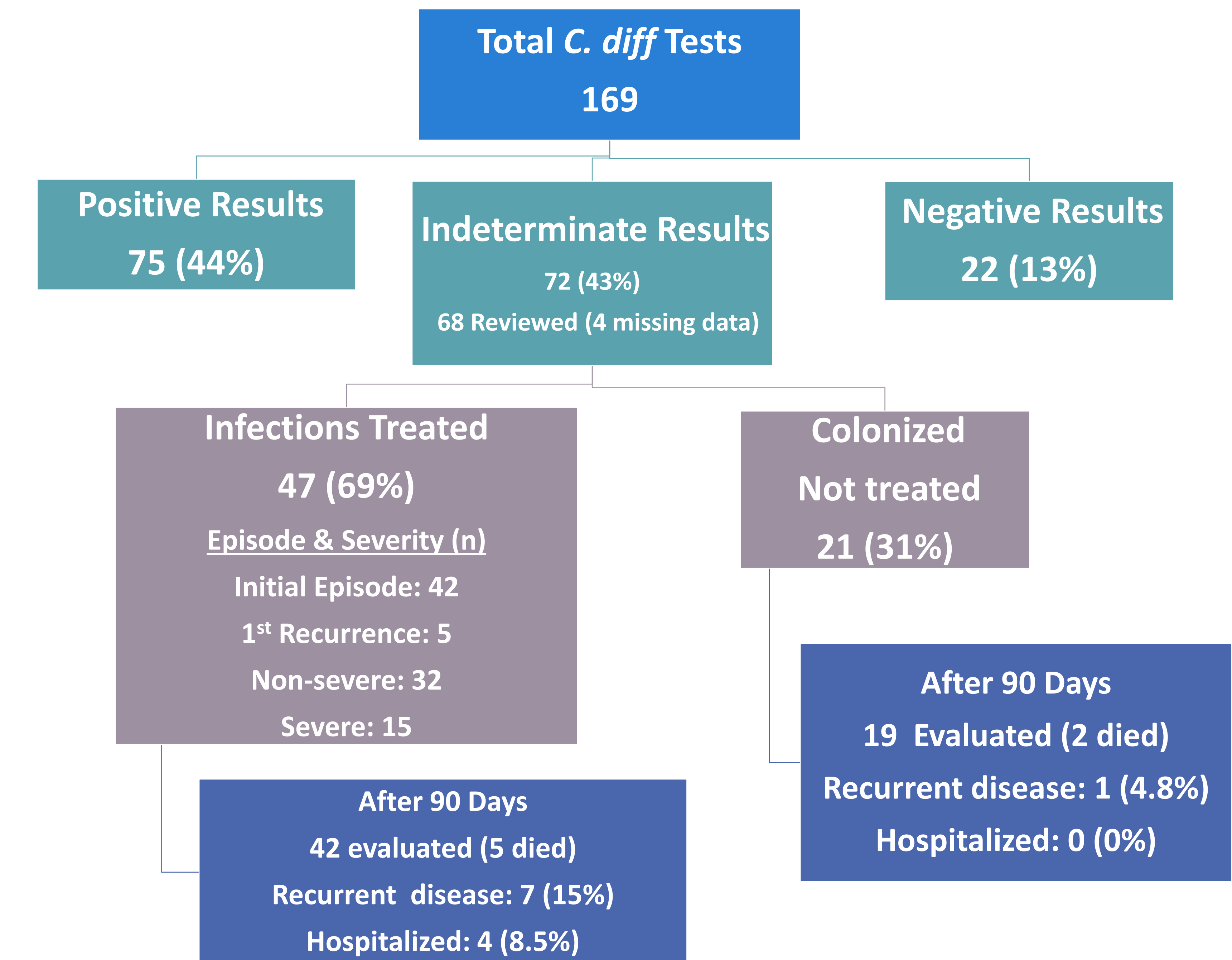

METHODS

- Analysis of results of stool samples submitted for testing between 6/1/2019 and 12/31/2019. A total of 169 specimens were reviewed.
- Prospective chart review and data collection by the Antimicrobial Stewardship program for all adult patients with stool samples tested at Centra lab for *C. difficile*.
- Indeterminate results were classified by episode severity and number according to guidelines.
- Patient records were reviewed during Antimicrobial Stewardship (AS) rounds by a physician and pharmacist to determine true infection versus colonization.
- For those patients considered to have an infection, treatment was recommended as per recent IDSA Guidelines.
- All patients with indeterminate results were followed for 90 days for documentation of infection or hospitalization due to *C. difficile.*

C. DIFF TESTING ADVISOR

RESULTS

Total *C. diff* Tests
169

Positive Results
75 (44%)

Indeterminate Results
72 (43%)
68 Reviewed (4 missing data)

Negative Results
22 (13%)

Infections Treated
47 (69%)
Episode & Severity (n)
Initial Episode: 42
1st Recurrence: 5
Non-severe: 32
Severe: 15

Colonized
Not treated
21 (31%)

After 90 Days
42 evaluated (5 died)
Recurrent disease: 7 (15%)
Hospitalized: 4 (8.5%)

After 90 Days
19 Evaluated (2 died)
Recurrent disease: 1 (4.8%)
Hospitalized: 0 (0%)

CONCLUSIONS

- Indeterminate results with 2 tier testing algorithms such as ours are common (43%).
- Clinical correlation of indeterminate results is critical to final algorithm interpretation: In our study, 2/3 of patients were classified as infected.
- A combined approach of provider education, an electronic testing advisor, a 2-tier testing algorithm and treatment according to recent IDSA Guidelines resulted in favorable outcomes for patients with indeterminate results.

REFERENCES

- Zou J, Leung V et al. Clinical heterogenicity of patients with stool samples testing PCR+/Toxin- from a two-step Clostridium difficile diagnostic algorithm. Eur J Clin Microb Infect Dis (2018) 37:2355-2359
- Gateau C, Couturier J et al. How to: diagnose infection caused by Clostridium difficile. Clin Microbiol Infect 2018; 24:463-468
- Madden G, German Mesner I et al. Reduced Clostridium difficile tests and Laboratory-Identified Events with a computerized clinical decision support tool and financial incentive. Infect Control Hosp Epidemiol 2018; :737-740