

A Multidisciplinary Approach to Decreasing *Clostridioides difficile* Events

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LEARNING OBJECTIVES

- Explain *C. difficile* infections and how they impact hospitals.
- Identify three process changes used to decrease *C. difficile* infections.

BACKGROUND

Clostridioides difficile is a life-threatening disease that can lengthen and complicate a patient's hospitalization.² Parkview Health, a hospital system in Northeast Indiana, is on a journey toward zero harm and high reliability. From 2017 to 2019, Parkview Health noted an increase in the number of *C. difficile* events and the standard infection ratio (SIR). In 2019, the organization convened a multidisciplinary task force (MDT) to address increases in *C. difficile* events. The events were a high of 43 in 2017 with an SIR of a high of 1.141 in 2020.

METHODS

Parkview Health *C. diff* Journey

Multidisciplinary *C. diff* Taskforce

- Executive Sponsor: Michelle Charles, MSN RN-BC
- Project Leader: Peggy Brown, MPH CIC
- *C. diff* Taskforce Stood-up: July 2019
- Goal: To reduce HO-*C. diff* events, decrease SIR and decrease cost

2019 Q3 to 2021 Q1

- CDI Reduction Taskforce kickoff, July 2019
- Build testing algorithm into Epic in 2 parts, Go-live Oct. 24, 2019
 - *C diff* nurse screening tool in nursing flowsheets
 - *C diff* GDH/Toxin test with clinical decision support (CDS) Order

2020 Q2 to 2020 Q4

- *C diff* Pathway order with CDS updates
 - GDH/Toxin test with reflex to molecular test for discordant results
 - *C diff* result hidden on GI BioFire Panel
 - Huddle Form developed and Case Review with Taskforce

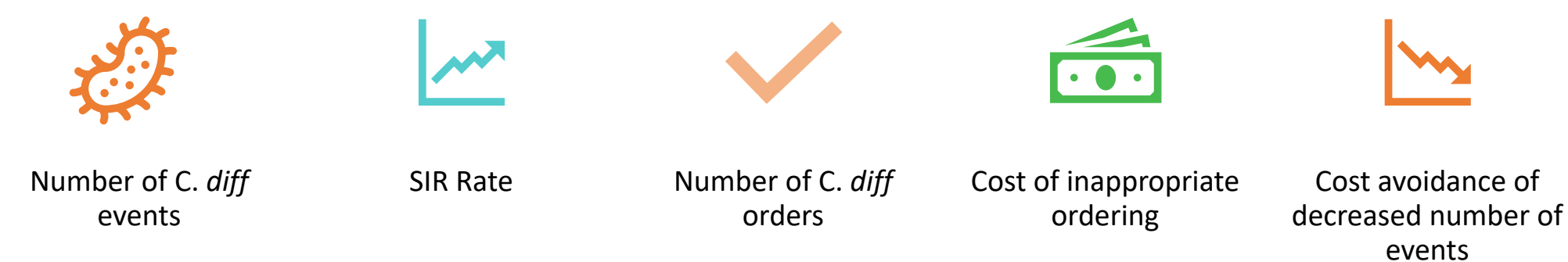
2021 Q1 to 2022 Q1

- *C diff* Pathway algorithm reversed March 2021
- *C diff* targeted Education
- Expanded Taskforce to include the Parkview Health Enterprise

Process Improvement Methods

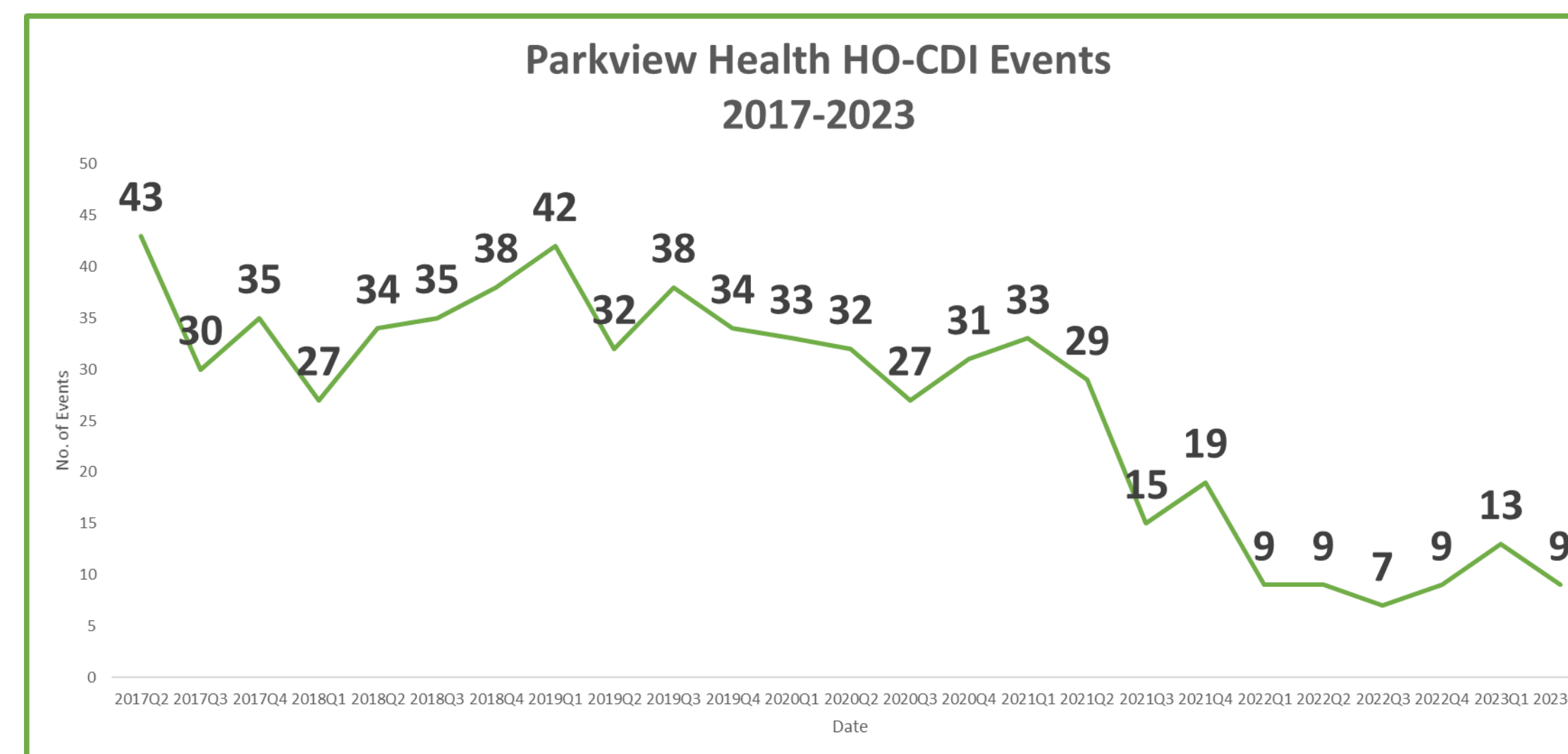
- Key Driver Diagram for multi-modal PI guidance
- PDSA Model for 30-, 60-, and 90-day evaluations
- Gemba Rounds

Key Performance Indicators: How do we measure success?

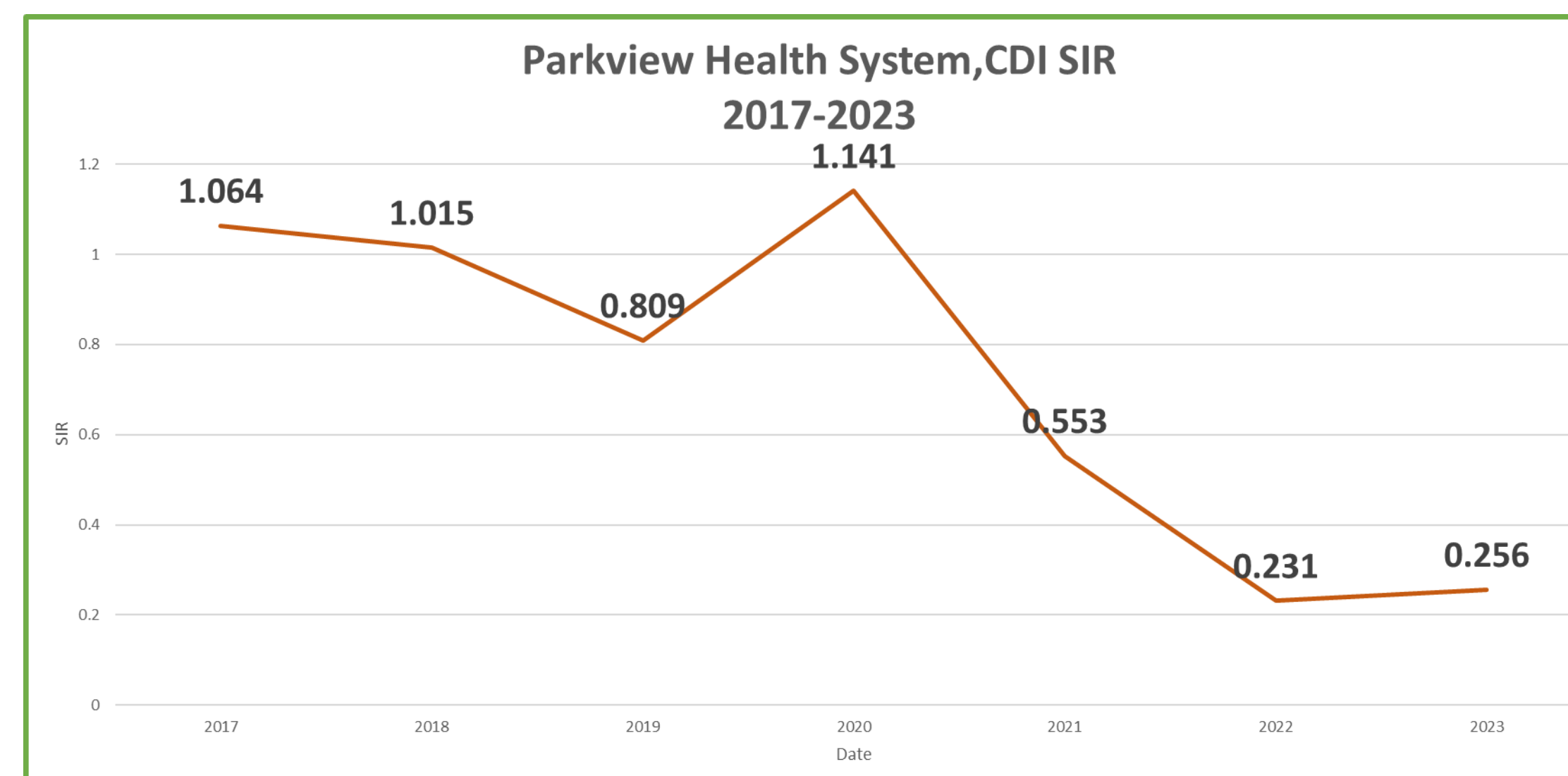


OUTCOMES

80% Decrease in CDI Events over 3 Years



81% Decrease in CDI SIR over 3 Years



DISCUSSION & CONCLUSION

The collaborative efforts of an MDT for PI projects is known to be highly effective in producing positive results.¹ Participation among key stakeholders is key to moving the project forward in an efficient fashion. Utilization of a Nursing Screen tool to identify CDI early in a patient's hospital stay in coordination with a Clinical Decision Support Order within the Electronic Health Record as well as changing of the lab algorithm led to a large decrease in CDI events and SIR over time.

KEY TAKEAWAYS

- Improvement should focus on a system-wide perspective
- This is a multi-year project
- Understanding the current state processes is important
- Develop key performance indicators upfront to measure success

LESSONS LEARNED

- ✓ Important to understand all the CDI orderables in the system
- ✓ Advocate to streamline the ordering process for the providers
- ✓ Unit rounding is important to continually educate and gain feedback from end-users

REFERENCES

1. Ndoro, S. Effective multidisciplinary working: the key to high-quality care. *British Journal of Nursing*. 2014; 23:717.
2. Walter C, Soni T, Gavin MA, Kubes J, Paciullo K. An interprofessional approach to reducing hospital-onset *Clostridioides difficile* infections. *American Journal of Infection Control*. 2022; 50:1346-4351.

AUTHOR CONTACT INFORMATION & DISCLOSURES

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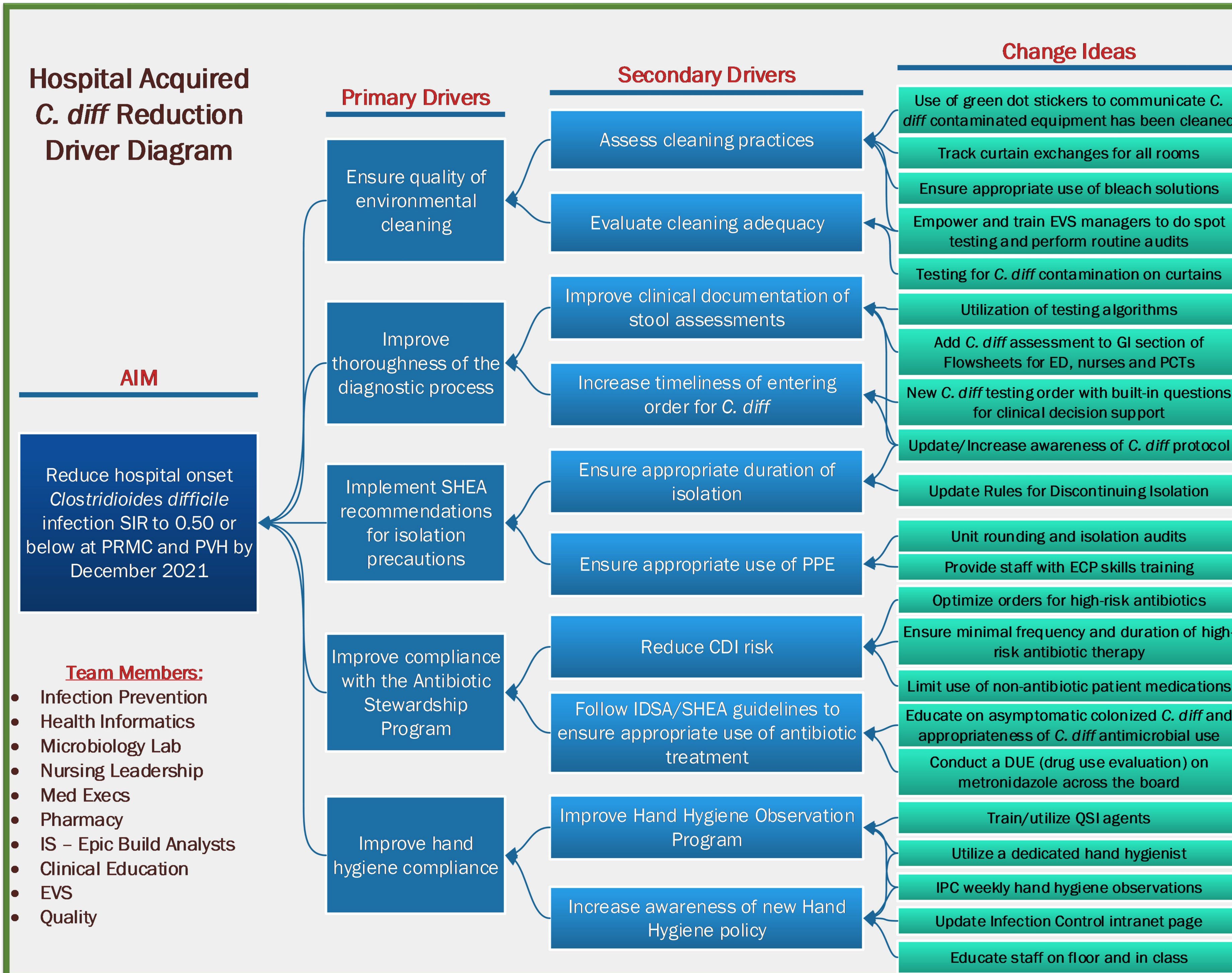
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KEY DRIVER DIAGRAM – Multi-modal PI tool



EDUCATION

- Huddle forms
- Front and back badge cards
- Annual competency reviews and skills video
- Monthly newsletters
- EHR email updates

Huddle forms

Date	Location / Duration	Pt Info	C diff Screening	Signs/Symptoms	CDI Risk Factors
5. 8/23/21	PLH MS, Day 6. Admitted to PLH on 8/18/21 after a 13-day hospitalization at PRMC. MICU 8/5-8/8, 7Med 8/8-8/18.	[REDACTED]	Multiple soft/loose stools daily throughout PRMC and PLH stays. Screening performed 8/5-8/8, 8/12 and 8/15. PLH resumed screening on 8/18-8/21, 8/24-8/26, 8/30-9/1. Protocol not used.	CDP negative 6/18/21, 8/8/21. Discharge Summary prior to PLH admission stated "Diarrhea, C diff ruled-out". Education opportunity: Each admission is to be considered a new encounter. TEST!	Admitted with metastatic non-small cell lung cancer. Chemotherapy stopped in June 2021 due to COVID-19 infection. Chronic opioids, antibiotics, and PPIs since June 2021.
6. 8/25/21	MICU, Day 9 Direct admit 8/17.	[REDACTED]	Screening performed daily. No loose stools charted until 8/23; screening option used was correct due to lax. Testing performed 48 hrs after on 8/25. Protocol not used.	C/o diarrhea upon admission. Admitted with progressive worsening SOB. Sxx included nonproductive cough, fever and diarrhea.	Pt admitted to MICU with COVID-19 infection from 8/9/21. Other complications include AKI requiring renal replacement therapy. Bacterial PNA - <i>Klebsiella pneumoniae</i> and <i>Pseudomonas aeruginosa</i> (8/23 & 8/28). Opioids, PPI, and abx since 8/17. Lax given 8/22-23.

Front and back badge cards

C. diff Testing

C. diff Pathway
PCR reflexed to toxin

- Nurse to collect raw stool in cup
- Note: GI Panel (w/o *C. diff*) does not include *C. diff* target
- Nurse to collect eSwab and cup of raw stool
- Lab will save raw stool for 2 days to add-on *C. diff* Pathway, if ordered

STOOL FOR *C. diff* MUST BE LOOSE OR IT WILL BE REJECTED

C. diff Infection (CDI) Considerations

Infection: PCR+, Toxin+
Colonization: PCR+, Toxin-

Considerations

- Common symptoms: multiple loose stools daily, colitis, dehydration, leukocytosis, fever, abdominal pain, nausea, and/or loss of appetite
- Risk factors: history of *C. diff* and recent use of antibiotics and/or acid suppressants
- Prevent gut dysbiosis in patient by prescribing antibiotic therapy when clinically appropriate

1960 (6-21)

Annual competency reviews and skills video education

Diagnostic and Antibiotic Stewardship

The provider will review clinical symptoms, imaging results (if available) and patient's condition before completing the lab order.

The GDH and Toxin A&B results will provide further insight whether the patient is negative, colonized, or infected with toxin-producing *C. diff*.

Antibiotic stewardship is key to reducing risk of antibiotic resistance and causing dysbiosis in the patient's gut flora.

In the presence of clinical symptoms and a positive toxin test, the provider will place the patient on proper antibiotic therapy immediately.

The GI panel test DOES NOT provide differentiation between colonization or infection. This test costs over \$400 more than the *C. diff* GDH and Toxin A&B test. Use judiciously.

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EHR OPTIMIZATION AND DIAGNOSTIC STEWARDSHIP

Nurse-driven *C. difficile* screening protocol built into Flowsheets

- ✓ Flowsheets > GI Assessment
- ✓ 5 options
- ✓ Link to open *C. diff* Nursing Protocol is provided if patient meets criteria for diarrhea
- ✓ Sidebar with definitions and guidance for assessment tool

Clinical decision support embedded into *C. difficile* lab order

- ✓ Cascading questions to assist with active decision support for the clinician
- ✓ Process instructions with clinical criteria for *C. Diff* testing
- ✓ Last result if one exists in Epic along with date, time and value

LABORATORY STEWARDSHIP

Reversal of Testing Algorithm: Reducing the SIR

Previous Testing Algorithm

Step 1: GDH/Toxin EIA (higher PPV)

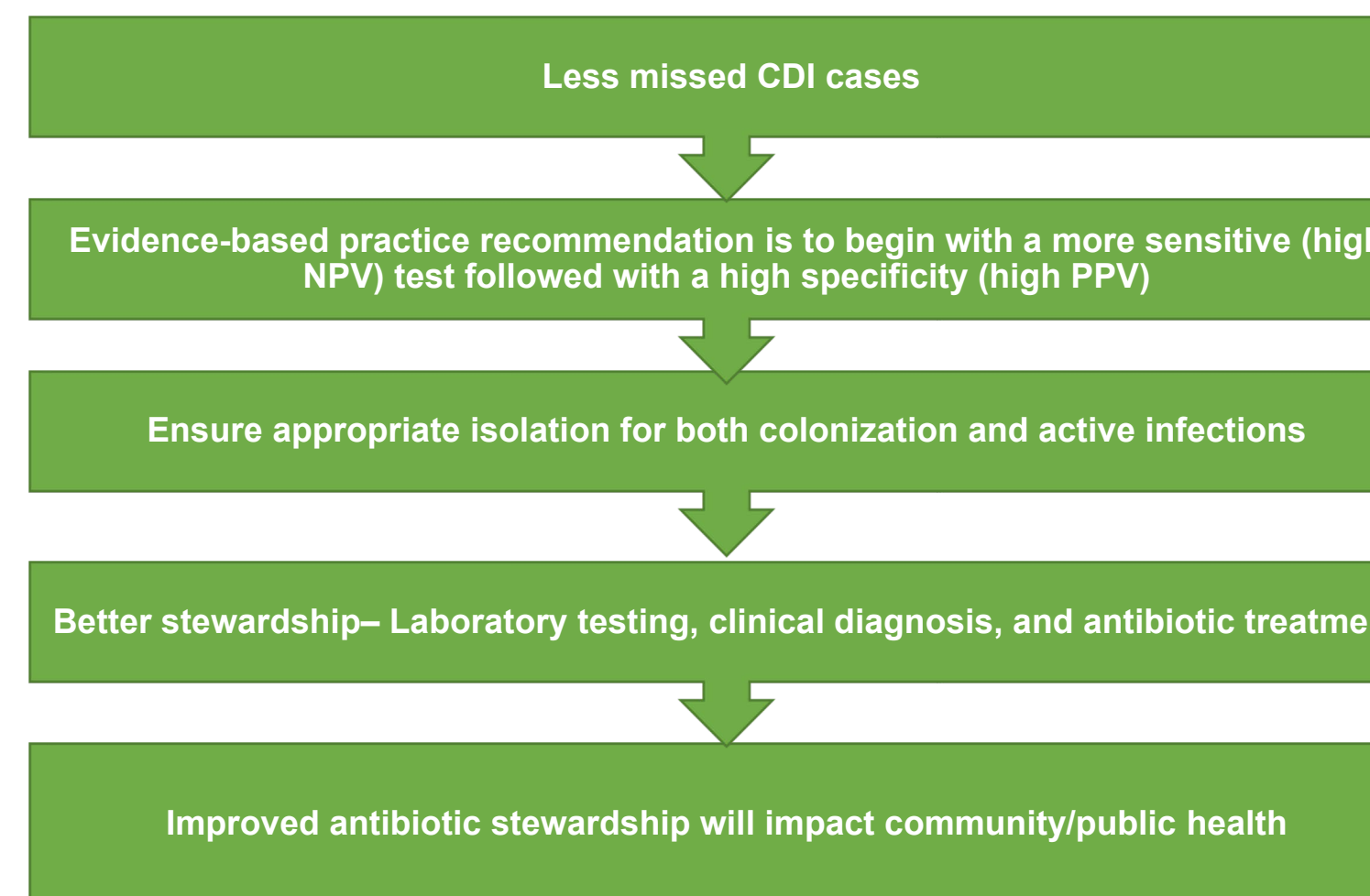
Test Name	Soft Test Code	Sens/Spec	Cost per Test	Annual Volume	Total Annual Cost
Clostridium difficile Pathway	CDGTO	79.5%/92.5	\$12.50	6000	\$75,000

New Testing Algorithm

Step 1: Molecular (high NPV – moves true negatives out of algorithm)

Test Name	Soft Test Code	Sens/Spec	Cost per Test	Annual Volume	Total Annual Cost
Clostridium Difficile	CDDNA	95.3%/94.7	\$18.00	6000	\$108,000

Reversal of Testing Algorithm: Improving Patient Health Outcomes

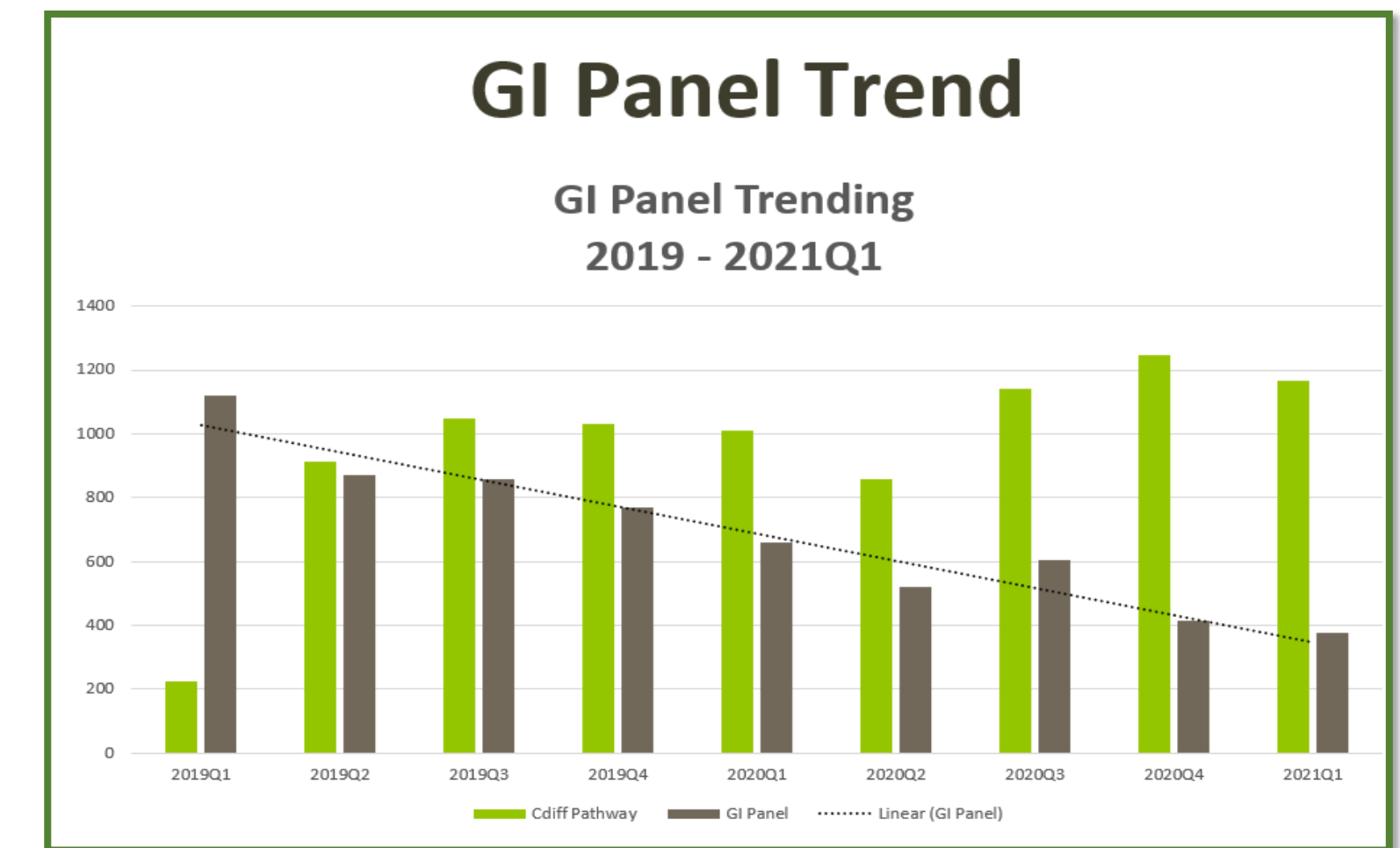


ANTIMICROBIAL STEWARDSHIP

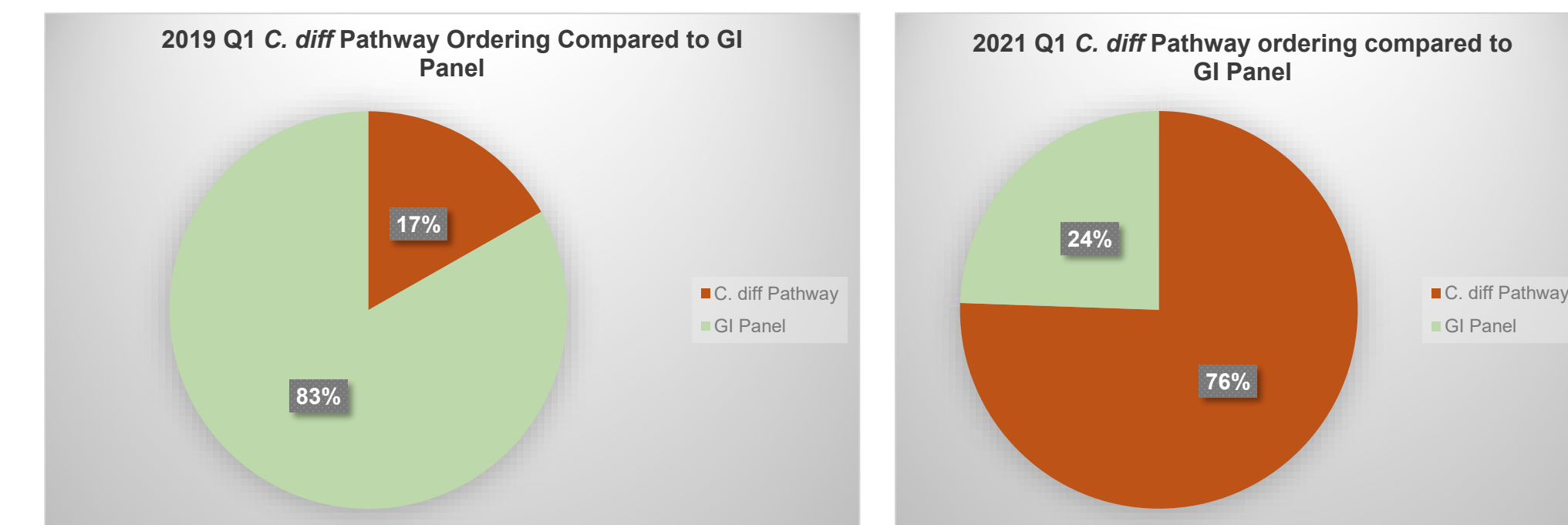
- Antimicrobial Stewardship Program started in 2016
- ID pharmacists provide consultative support to prescribing providers
- Next steps: EHR optimization to control inappropriate anti-CDI treatment for asymptomatic colonized CDI patients

COST SAVINGS

C. diff Ordering Patterns



GI Panel Cost: \$463.09 *C. diff* Pathway: Cost \$11.20



Cost Savings of \$648,670 Dollars over 2 Years from Decreasing Inappropriate Testing

