Multi-modal Quality Improvement Study to Reduce *C. difficile* Detection and Infections in Hospitalized Children

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BACKGROUND

- Rising rates of *Clostridiodes difficile (C.diff)*
- Intro of Gastrointestinal Panel (GIP) → immediate ↑ in *C.diff,* driven, in part, by test changes
- Tests cannot differentiate true *C.diff* infection vs. colonization, and ↑ testing ↑ risk for detecting asymptomatic colonization
- Inappropriate testing → over-treatment → ↑ costs, side effects, resistance
- **AIM: Reduce *C.diff* hospital-acquired infections (HAI) and detection by 20%**

METHODS

- **Design**: Quality improvement study
- **Population:** Hospitalized children w/ stool testing (2018-2020)
- **Intervention bundle:**
  - Education & clinical pathway
  - New testing options: GIP w/ or w/o *C.diff*
  - Electronic clinical decision support tool – restrictions, alternatives, optional approval
  - Preventative cleaning measures
- **Outcomes:** *C.diff* HAI rates and detection per 10k patient-days (PD
- **Process:** % stools capable of detecting *C.diff*
- **Balancing:** % patients w/ non-reported (+) *C.diff* (GIP w/o *C.diff* ordered) that was ultimately released due to concern for true infection and treated, % w/ adverse event or reutilization
  - Monitored in real time by ID expert for 7 mo
- **Antibiotics saved** (10d, 100% treatment rate)
- **Statistical Process Control Charts**

RESULTS

Stool Testing:
- 2,001 tests performed for 1,982 encounters
- Median age children 8 years (2-15)
- 51% testing on medical/GI team, 21% heme/onc, 23% ICU, 6% cardiology

Outcomes:
- 55% ↓ in hospital-wide *C.diff* HAI rates (*Figure 1*)
- 44% ↓ in *C.diff positive results*

Process:
- 44% ↓ in testing capable of detecting *C.diff (Figure 2)*
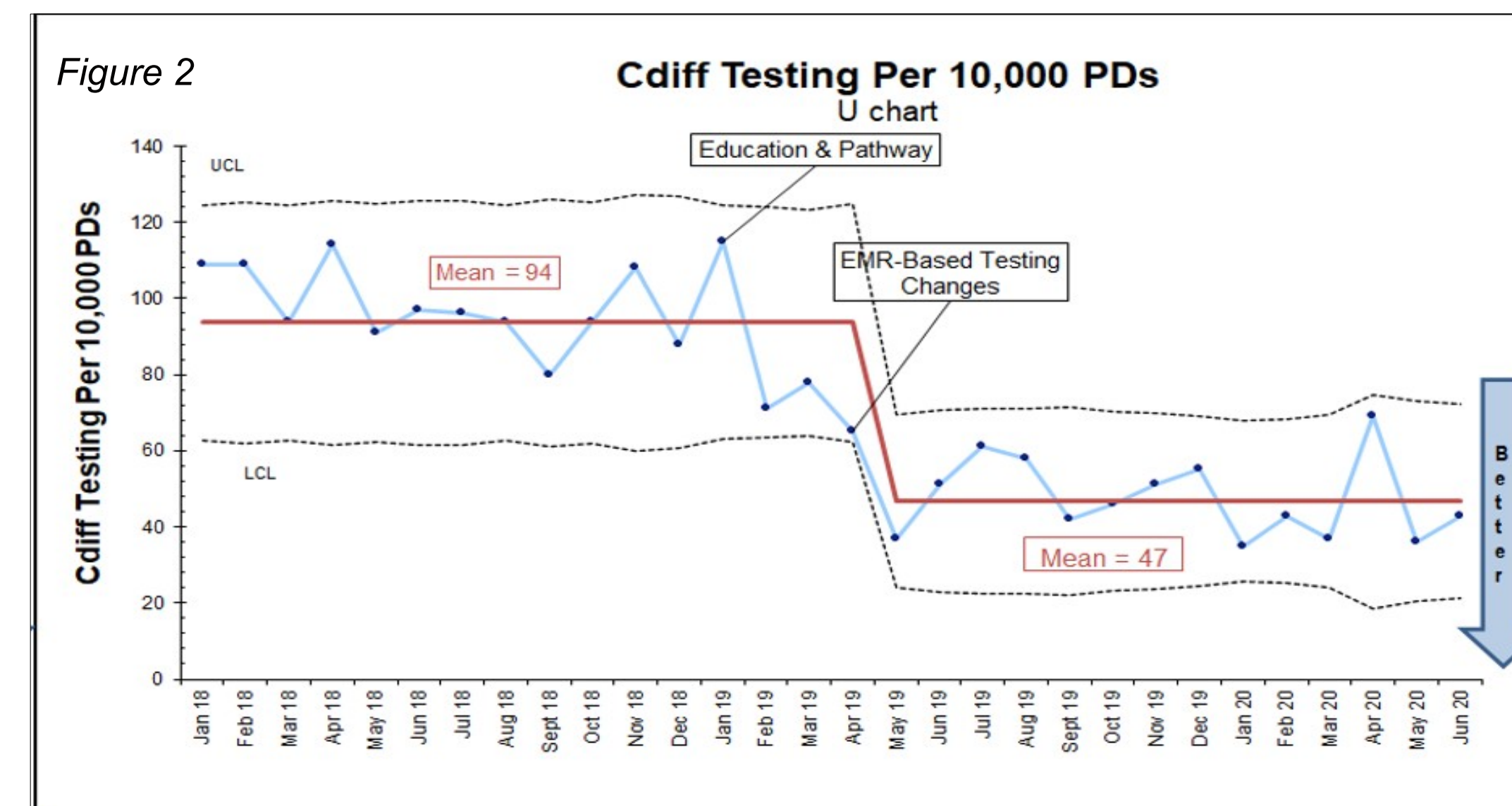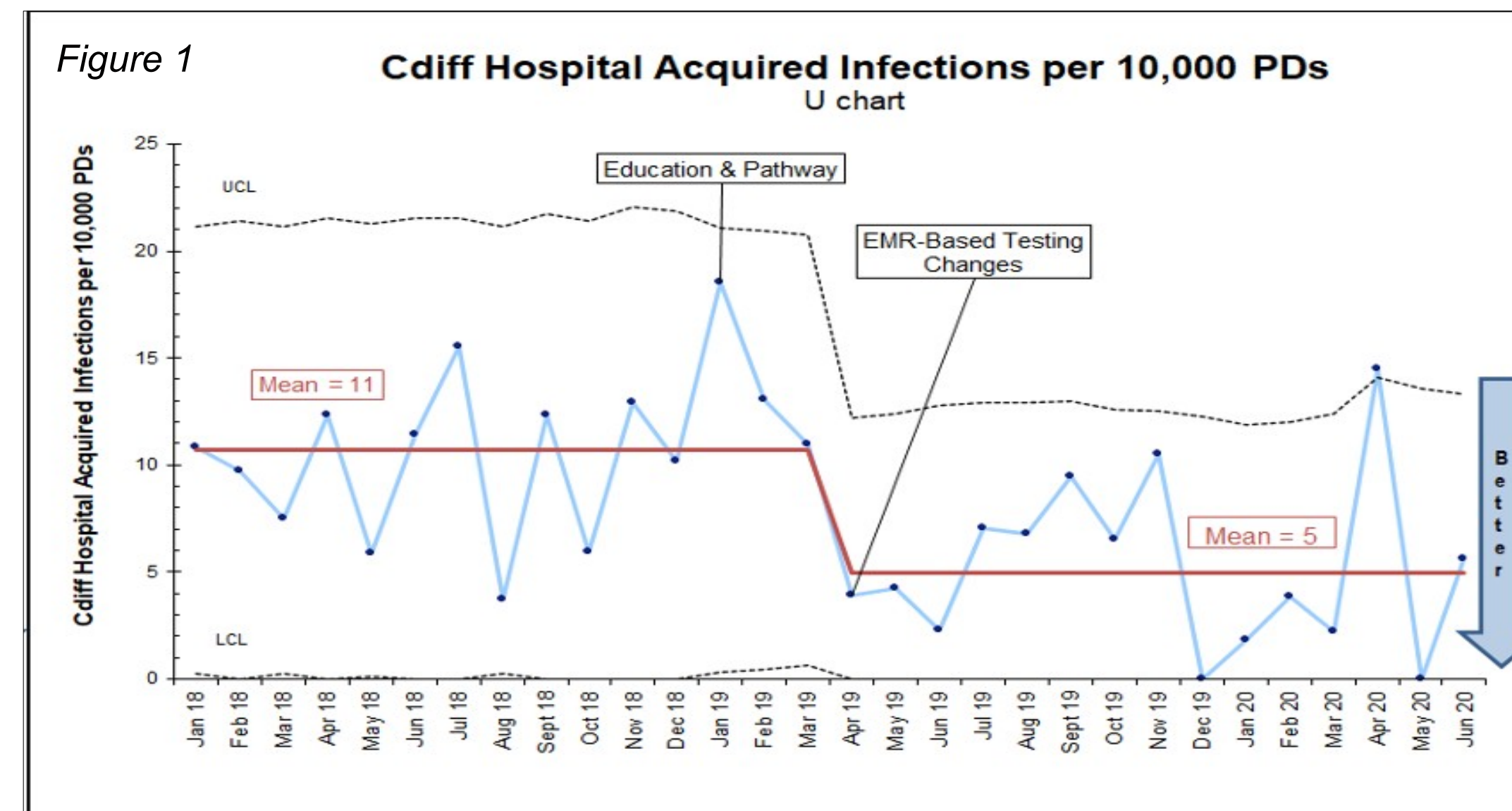
Balancing:
- Only 2.4% (2/84) non-reported *C.diff* (+) tests were ultimately released due to concern for true infection and treated
- Of patients with non-reported *C*.diff (+) that remained suppressed (n=82)
  - Most (81%) were <1yo or coinfected with another organism
  - None had adverse event
  - 6% had GI-related revisit or readmission (2/4 re-tested, both +Cdiff, only 1 treated)
  - Only 2.4% underwent repeat testing

Antibiotics saved:
- 1,371 antibiotic days could be avoided annually

Stool Testing Restriction → Alternatives	
No GIP w/ *C. difficile* in children <1 year old	GIP w/o *C. difficile*
No GIPs for children hospitalized for >96 hours*	*C. difficile* PCR
No testing if no evidence of diarrhea (bristol stool scale)*	
No testing if recent negative stool test in the last 7 days	
No testing if recent positive stool test in the last 14 days	
No testing if laxative use in the last 24 hours*	* Inpatients only

Figure 1 — Cdiff Hospital Acquired Infections per 10,000 PDs (U chart)

Figure 2 — Cdiff Testing Per 10,000 PDs (U chart)

CONCLUSIONS

- Education coupled with EMR-based testing changes resulted in an impactful and sustained ↓ in *C. difficile* detection and HAI rates
- Diagnostic stewardship led to a reduction in infection rates, likely by reducing tests with a low pre-test probability of true infection
- Diagnostic stewardship can help promote antibiotic stewardship

IMPLICATIONS

Multi-modal interventions can safely reduce *C. diff* testing, detection, and infection

DISCLOSURES

None