




## Original Article

# Hardwiring diagnostic stewardship using electronic ordering restrictions for gastrointestinal pathogen testing

Jasmine R. Marcelin MD<sup>1</sup> , Charlotte Brewer BSN, RN<sup>2</sup>, Micah Beachy DO<sup>3</sup>, Elizabeth Lyden MS<sup>4</sup>, Tammy Winterboer PharmD<sup>2</sup>, Caitlin N. Murphy PhD<sup>5</sup>, Paul D. Fey PhD<sup>5</sup>, Lauren Hood MS, BSN<sup>2</sup> and Trevor C. Van Schooneveld MD<sup>1</sup>

<sup>1</sup>Division of Infectious Diseases, University of Nebraska Medical Center, Omaha, Nebraska, <sup>2</sup>Nebraska Medicine, Omaha, Nebraska, <sup>3</sup>Department of Medicine, University of Nebraska Medical Center, Omaha, Nebraska, <sup>4</sup>College of Public Health, University of Nebraska Medical Center, Omaha, Nebraska and <sup>5</sup>Department of Pathology & Microbiology, University of Nebraska Medical Center, Omaha, Nebraska

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# Hintergrund

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- Infectious diarrhea is very common<sup>1</sup>
- Most cases are self-limited<sup>2</sup>
- Kosteneffektivität von GI-Panels umstritten:
  - Verkürzung der Isolationstage
  - Günstiger als mehrere Einzelanalysen

# Empfehlungen IDSA 2017 (Auszug)<sup>1</sup>

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- Detailed clinical and exposure history should be obtained.
- People with fever or bloody diarrhea should be evaluated for enteropathogens for which antimicrobial agents may confer clinical benefit (incl. *Salmonella enterica* subspecies, *Shigella* and *Campylobacter*)
- Stool testing should be performed for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, *C.difficile* and STEC in people with diarrhea accompanied by fever, bloody or mucoid stools, severe abdominal cramping or tenderness, or signs of sepsis.
- A broader set of bacterial, viral and parasitic agents should be considered in the context of a possible outbreak.
- A broad differential diagnosis is recommended in immunocompromised people with diarrhea.
- Diagnostic testing is not recommended in most cases of uncomplicated traveler's diarrhea (<14 days).
- Clinical consideration should be included in the interpretation of results of multiple-pathogen nucleic acid amplification tests because these assays detect DNA and not necessarily viable organisms.
- Follow up testing is not recommended in most people for case management following resolution of diarrhea.

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<sup>1</sup>Shane et al, IDSA Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea, Clin Inf Dis 2017

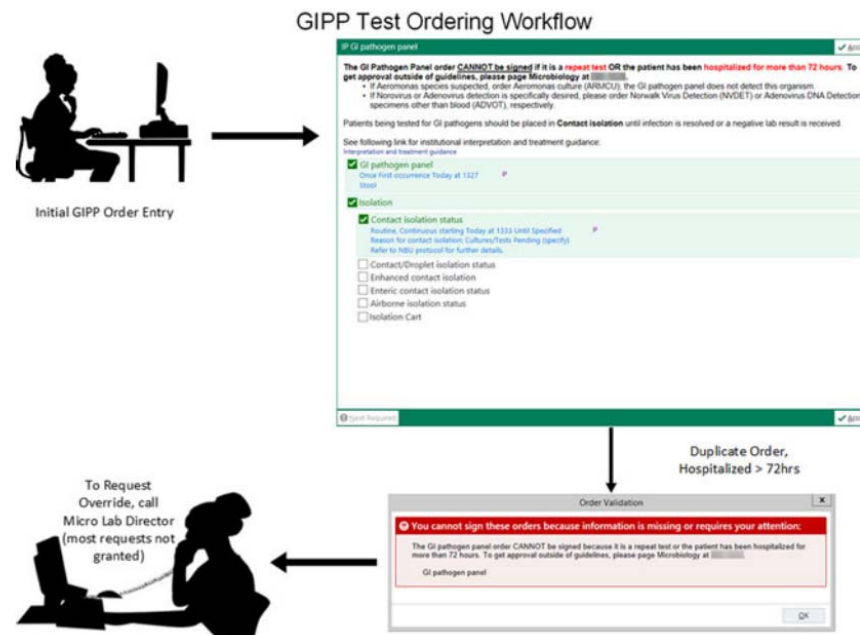
# Hintergrund

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- Implementation gastrointestinal PCR Panel (GIPP) 2015, traditional stool cultures no longer offered
  - Shortened turnaround time from 55.5 h to 3.9h
  - Results:
    - 40.4% 1 pathogen
    - 7.8% Coinfections
    - Most common pathogens:
      - *C. difficile* 15.2% (not reported to the clinician)
      - Norovirus 8.9%
      - EPEC 7.1%, EAEC 3.4%, Campylobacter spp. 2.3%, Sapovirus 2.0%
  - *C.difficile*: GDH +/- EIA
  - 19.9% inappropriate tests
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# Hypothesis

Rate of GIPP stays the same in period two (with the intervention) as in period 1 (without the intervention)



# Methods

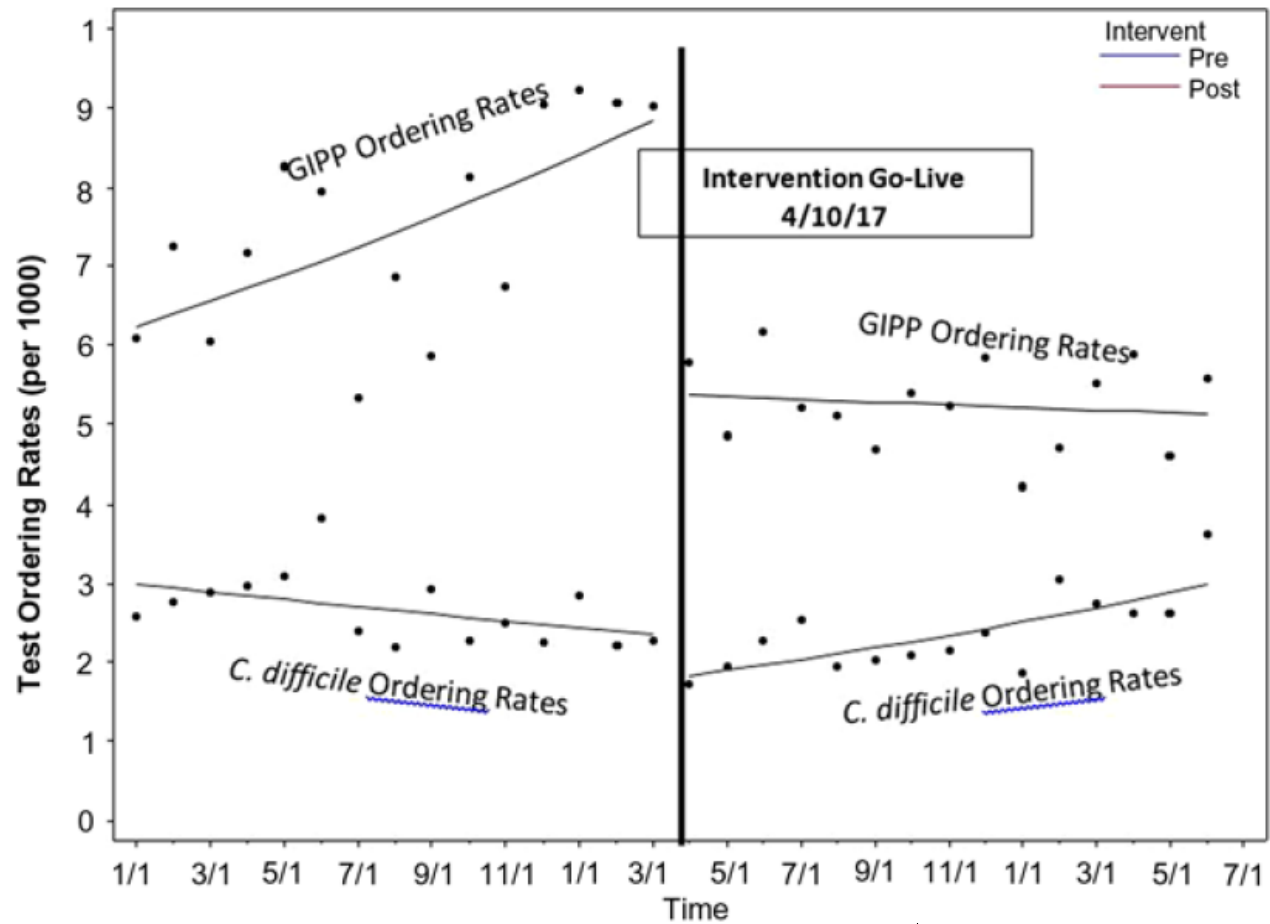
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- Quasiexperimental study: before and after implementation of an electronic health record (EHR) alert
  - Two time periods: Jan 2016 – March 2017 and April 2017 – Jun 2018
  - Intervention: hard stop in EHR preventing clinicians from ordering a gastrointestinal pathogen panel (GIPP)
    - Duplicate ordering
    - Patient hospitalized > 72 h
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# Results

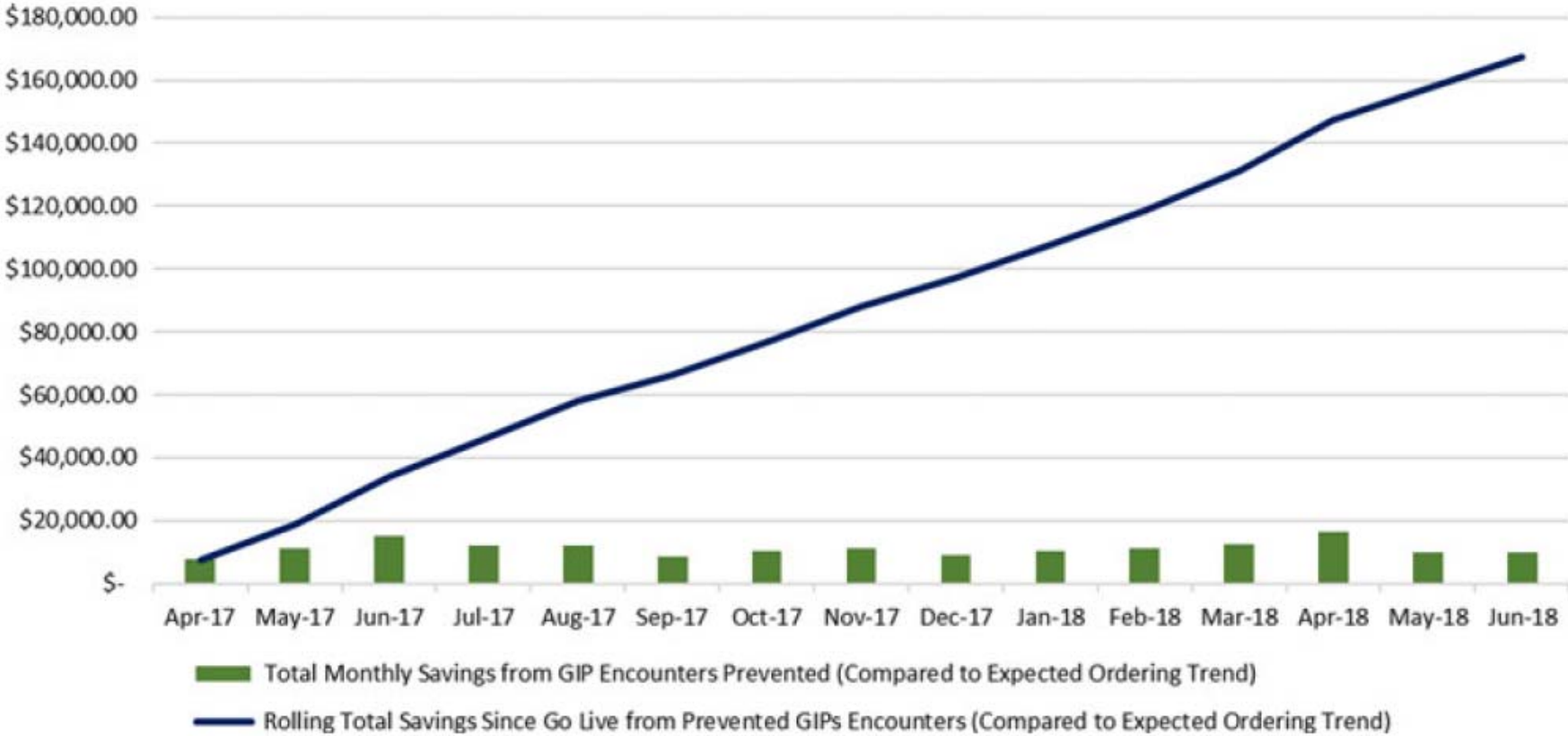
January 2016 through March 2017			April 2017 through June 2018			
All Patients	No. of GIPPs	No. of GIPPs/1,000 Patient Days	% of Total GIPPs	No. of GIPPs	No. of GIPPs/1,000 Patient Days	% of Total GIPPs
“Appropriate” GIPP testing (<72 h and not duplicate)	1,246	5.87	78.5	1,108	4.98	95.1
0 positive components	939	4.42	59.2	838	3.77	71.9
1 positive component	262	1.23	16.5	229	1.03	19.7
2 positive components	35	0.16	2.21	31	0.14	2.66
3 positive components	9	0.04	0.57	9	0.04	0.77
4 positive components	1	0.00	0.06	1	0.00	0.09
“Inappropriate” GIPP testing (>72 h and/or duplicate)	341	1.61	21.5	57	0.26	4.89
0 positive components	274	1.29	17.27	52	0.23	4.46
1 positive component	66	0.31	4.16	5	0.02	0.43
2 positive components	1	0.00	0.06	0	0.00	0.00
3 positive components	0	0.00	0.00	0	0.00	0.00
4 positive component	0	0.00	0.00	0	0.00	0.00
<b>Grand Total</b>	<b>1,587</b>	<b>7.48</b>	<b>100.00</b>	<b>1,165</b>	<b>5.24</b>	<b>100.00</b>

# Results: interrupted time series analysis





# Results: cost analysis



# Discussion

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- Diagnostic stewardship:
    - Improved patient satisfaction
    - Reduction of irrelevant or false-positive test results and non-beneficial treatment
    - Cost savings
    - Acceptance by ordering physicians?
  - Alert:
    - Active and interruptive alerts more likely to be noted
    - Repeated and excessive alerts decrease acceptance
  - Other ideas?
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