

Impact of Q-UTI Collaborative on Diagnostic Evaluation in Children with First Febrile Urinary Tract Infection

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Disclosure of Financial Relationships

- Chrissy Hrach, MD and Co-Authors have documented that they have no financial relationships to disclose or Conflicts of Interest (COIs) to resolve.
- This presentation will not involve discussion of unapproved or off-label, experimental or investigational use.

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Background



- 2008 - Value in Inpatient Pediatrics (VIP) Network created
 - Pediatric inpatient quality improvement collaborative
 - Links both academic and community-based hospitalist groups
 - Goal - improve the care of hospitalized children nationally
- 2011 – The AAP revised the clinical practice guideline (CPG) for first febrile urinary tract infection (UTI) in children 2-24 months of age
- 2015 – VIP Network developed a UTI-focused project



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Background

- Quality Improvement for the Management of Children Hospitalized with Urinary Tract Infection (Q-UTI) project was designed to improve care to pediatric patients hospitalized with an initial UTI
- Expert panel established and quality metrics defined
- 42 VIP Network hospitals selected for participation in Q-UTI

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VIP Q-UTI Project Expert Group

- **Richard Engel, MD (Project Co-Chairperson)**
 - University of Arizona College of Medicine-Phoenix
- **Brian Pate, MD (Project Co-Chairperson)**
 - University of Kansas School of Medicine - Wichita
- **Matthew D Garber, MD, FHM FAAP**
 - University of South Carolina-SOM
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 - St Joseph Health-Santa Rosa
- **Kenneth Roberts, MD, FAAP**
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- **Leticia Shanley, MD**
 - Children's Medical Center-Dallas, TX
- **Sowdhamini Wallace, DO, FAAP**
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- **Steven Kairys, MD, MPH, FAAP**
 - QIIN Medical Director
- **American Academy of Pediatrics (AAP) Staff**
 - **Faiza Khan, MPH**
 - **Liz Rice-Conboy, MS**
 - **Keri Thiessen, M Ed**

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Background

- Little quality improvement work has been published since release of the AAP CPG, and none have involved multi-center projects of both academic and community hospitals
- It is unclear whether participation in a quality improvement network may impact implementation of CPGs
- We aimed to describe whether diagnostic practice changed after implementation of a bundle of interventions among participating sites in the Q-UTI collaborative

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Methods

- Quality improvement study from 7/2015-10/2016
- Population included hospitalized children 7 days – 24 months old with first UTI and fever
- Children excluded if admitted to intensive care unit or had genitourinary comorbidities
- Baseline period = the first 3 cycles (3 months each)
- Intervention period = 4 additional cycles after QI efforts implemented

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Individual Site Interventions

- Performed PDSA cycles of improvement
- Aided by bundle of resources:
 - Educational webinars
 - Order sets
 - Guideline examples
 - Site coaches
 - Web-based data aggregation system

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Outcome Measures

- Percentage occurrence of the following:
 - Urine specimens obtained via catheterization or suprapubic aspiration
 - Presence of pyuria on diagnostic urinalysis
 - Diagnostic urine culture with $\geq 50K$ CFU with a single uropathogen

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Urine Collection Method

Percent of diagnostic urine cultures obtained via cath/SPA and documented for all patients

Goal: $\geq 95\%$

Diagnostic Urinalysis

Percent of abnormal UAs used for diagnosis

**Goal: $\geq 90\%$
(patients 7 – 59 days)**

**Goal: $\geq 95\%$
(patients 2-24 months)**

50K CFU Criteria on Culture

Percent diagnostic urine cultures made using a culture of $\geq 50K$ CFU with a single uropathogen

**Goal (patients 7 – 59 days):
Benchmarking only**

Goal (patients 2 – 24 months): $\geq 95\%$

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Data Collection & Analysis

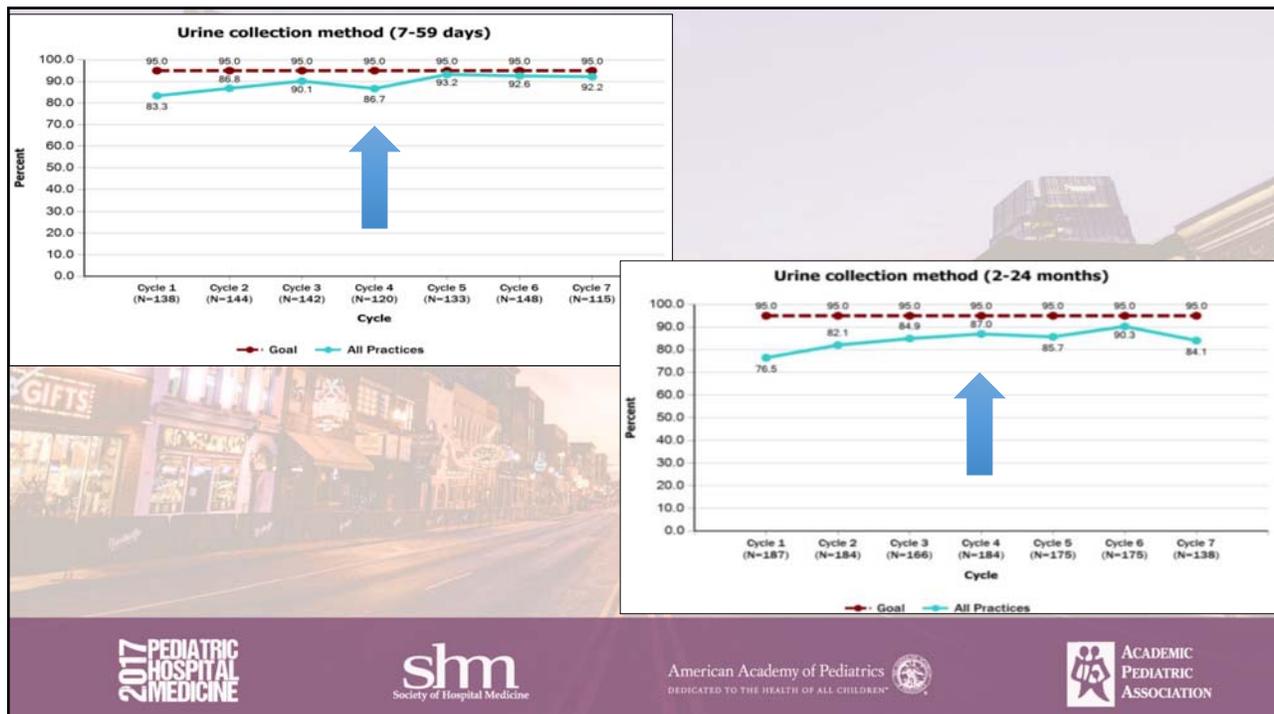
- For each 3 month cycle, hospital sites identified eligible patients using ICD-9/10 codes
- Chart review performed by each site to verify eligibility and collect data on outcome measures (≤ 20 charts per cycle)
- Run charts created for each site and for aggregate collaborative data using the AAP's Quality Improvement Data Aggregator (QIDA)
- Chi square test used to assess statistically significant differences of outcomes pre and post implementation of Q-UTI interventions

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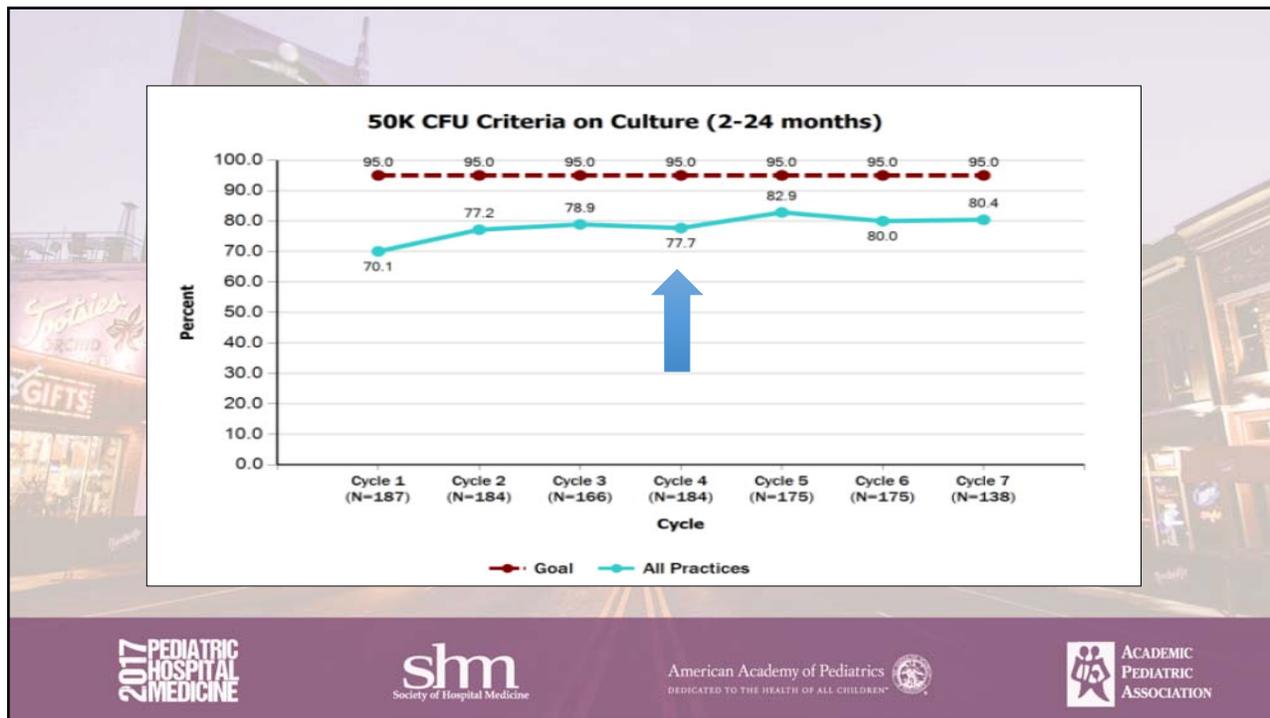


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Results

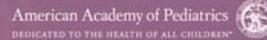
	Baseline	After project	p value
Collection of urine via sterile methods (7 days – 24 months)	803/961 (84%)	1055/1188 (89%)	P < 0.001
Frequency of utilizing pyuria on UA for diagnosis (7days – 24 months)	826/961 (86%)	1100/1188 (93%)	P < 0.001
Diagnostic urine culture contained ≥ 50K CFU of a single uropathogen (2-24 months)	404/537 (75%)	539/672 (80%)	P = 0.04

Limitations

- Our study design did not account for secular trends over time
- We are unable to ascertain the impact of individual site interventions on aggregate outcomes data

Conclusions

- Most sites in the Q-UTI collaborative are adhering to the AAP CPG recommendations for diagnostic evaluation
- After site-specific PDSA cycles and collaborative interventions:
 - Significant further improvements were seen in the acquisition of urine via sterile methods AND
 - In the application of diagnostic criteria to children with fever and potential UTI
- Collaboratives that provide education, resources and infrastructure to sites for quality improvement may yield better implementation of evidence-based recommendations



Thank you

- Rick Engel, MD and Brian Pate, MD
 - VIP Q-UTI Project Co-chairs
- Q-UTI expert panel
 - Katherine O'Connor, MD
 - Leticia Shanley, MD
 - Sowdhamini Wallace, DO
 - Ken Roberts, MD
 - Matt Garber, MD
 - Rachel Marek, MD
- Faiza Wasif – Project Manager
- 42 VIP Network Collaborating Sites

