Quality Improvement for the Management of Children Hospitalized with Urinary Tract Infection (Q-UTI)

BACKGROUND
Urinary tract infections (UTI) are the most common serious bacterial infections in infants and young children, affecting 2-5% of all children.¹ In September of 2011, the American Academy of Pediatrics (AAP) developed a Clinical Practice Guideline to aid in the accurate diagnosis and appropriate treatment of UTI.¹ Recent studies have further investigated various aspects of UTI management and have added to our understanding of issues such as the relationship of UTI to renal scarring or chronic kidney disease,²,³ and the utility of prophylactic antibiotics in patients with vesicoureteral reflux.⁴ Despite this added research, certain aspects of UTI management have remained controversial⁵,⁶ leading to significant variation in care. Very little quality improvement work has been published in this area since release of the AAP Guideline, and we are not aware of any multi-center projects involving both academic and community hospitals.⁷

Given the national emphasis on value-driven care, or achieving quality care at lowered costs, reducing variation of care can improve quality metrics for patients and reduce health care costs for the system.⁸ In 2008, the Value in Inpatient Pediatrics (VIP) network was created as an inclusive pediatric inpatient quality improvement collaborative that links both free-standing and community-based hospital groups, to improve the care of hospitalized children nationally. To date, VIP has approximately 236 pediatric hospitalist members from 164 different hospitals across 42 states. In addition, VIP has already demonstrated a reduction of unnecessary utilization of resources in bronchiolitis and community-acquired pneumonia through collaborative quality improvement initiatives.⁹

This collaborative improvement project will expand on the existing infrastructure of the VIP network to use health information technology to improve delivery of care of pediatric patients with UTI. The AAP has a new web-based data aggregation system, Quality Improvement Data Aggregator (QIDA), which will be utilized for this project. QIDA will facilitate electronic exchange of de-identified health information, reporting of performance against our measures and sharing of strategies for improving the care of patients hospitalized with UTI at their individual institutions, potentially leading to reduced variation of care and increased value.

Up to 25 hospital teams will be included in the community of learners and will collaborate over about a 18 month period (including a 15-month action period with three additional months for pre-work and wrap-up) to make improvements in practice. The aims noted below are considered goals for individual hospital site teams, as well as for the overall aggregate of the quality improvement collaborative (all involved hospital sites). The decreases and increases noted below will be judged against the baseline rates gathered at the beginning of the project (baseline rates will be retained from retrospective UTI chart review).


PROJECT AIM & GOALS
The specific aim of the project is improve the value of care for children 7 days to 24 months hospitalized because of UTIs in the domains of diagnostic strategy, imaging and treatment based on the recommendations in the 2011 AAP clinical practice guideline on urinary tract infection, as well as other relevant clinical evidence. The following are the outcome measures, for patients hospitalized with a first UTI:

1. Increase percent of patients aged 2-24 months with a duration of antibiotic treatment between 7-14 days to ≥95%
2. Decrease use of intravenous (IV) antibiotics after discharge in children 2 – 24 months to ≤5%
3. Increase percent of diagnostic urine cultures obtained via catheter/suprapubic aspiration to ≥95% for all children between age of 7 days – 24 months
4. Increase overall percent of abnormal urinalysis used for diagnosis of UTIs
   a. to 90% for patients 7 – 59 days
   b. to 95% for patients 2 – 24 months
5. Increase percent of diagnostic urine cultures made using a culture with greater than 50K CFU of a single uropathogen to ≥95% in patients between the age of 2-24 months
6. Decrease percent of voiding cystourethrogram (VCUG) obtained without abnormal ultrasound in patients 2-24 months to ≤5%
7. Increase percent of renal ultrasound (RUS) in patients age 7 days – 24 months diagnosed with first time UTI to ≥90%
Decrease the prescription of prophylactic antibiotics at discharge to less than or equal to 5% for patients ages 2-24 months. The project balancing measures are:
1. Length of stay
2. Rate of readmission

In addition to the above outcome and balancing measures, we will utilize the engagement of this network focused on UTI to develop benchmarking data for diagnostic and management practices for which clear recommendations do not exist. These data will identify variation in practice and serve as the foundation for future improvement projects. Data will be collected to develop the following benchmarks:

1. Antibiotic treatment duration in patients age 7 – 59 days
2. Percent of patients age 7-59 days prescribed IV antibiotics after discharge
3. Percent of patients age 7 days – 24 months with blood cultures obtained during admission
4. Percent of obtained blood cultures positive with same pathogen as urine culture in patients age 7 days – 24 months
5. Percent of diagnostic urine cultures made using a culture of greater than 50K CFU with a single uropathogen in children 7 – 59 days
6. Rate of VCUG utilization without abnormal ultrasound in patients age 7 – 59 days
7. Percent of patients between age of 7 – 59 days prescribed prophylactic antibiotics at discharge

Each of these outcomes has a standard definition which will be utilized across sites within the project.

EXPECTATIONS OF HOSPITAL TEAM
Each participating hospital will have a core improvement team, and are encouraged to have an interdisciplinary team with both physicians and non-physicians. All other clinicians in the hospital are encouraged to participate in the project at the local level, but will not have the same responsibilities as the core improvement team. These other clinicians will be involved in the use and testing of the tools, as well as providing patient charts for review by the core improvement team. Sites are encouraged to have three team members; in some cases it will be acceptable to have 4 team members if the interest is strong across several disciplines (for example, ED physician, pharmacist, nurse and lead physician).

Participating individuals (as part of the core improvement team) will work over the course of 15 months to implement and test strategies in pediatric UTI care. To participate in this project, core improvement team members will need to attend at minimum an orientation conference webinar, and four 60-minute webinars (includes the debriefing session) and participate quarterly chart reviews. Each team will need to complete a pre- and post-survey and complete a quarterly progress report.

LEARNING SESSIONS
Project learning sessions will take place via webinar on a periodic basis. Below is a tentative schedule of the webinars that will be offered with the option of adding 1-2 additional live and/or pre-recorded webinars as needed:
- Webinar #1: Project, QIDA & QI Orientation and preliminary introduction to change package
- Webinar #2: Pre-recorded tutorial on QIDA data entry (required for Group Administrator; optional for others)
- Webinar #3: Review of Pre-project surveys and baseline data
- Webinar #4: Review of next data cycle results
- Webinar #5: Review of Periodic Progress Report 2 and next data cycle
- Webinar #6: Pre-recorded webinar on “leading change” (available on demand)
- Webinar #7: Review of next data cycle and Periodic Progress Report 3
- Webinar #8: Final report out of project

TIMELINE FOR PARTICIPATING HOSPITALS & TEAM MEMBERS

<table>
<thead>
<tr>
<th>Application Process</th>
<th>Pre-work</th>
<th>Action Period</th>
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<tbody>
<tr>
<td>• Form core improvement team and determine roles of each member</td>
<td>• Sign Consent Form</td>
<td>• Participate in minimum 4 webinars (Review data, strategies and employ quality improvement sustainability)</td>
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<tr>
<td>• Attend informational webinar (optional)</td>
<td>• Complete Pre-survey</td>
<td>• Submit four progress reports</td>
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<td>• Participate in the Project, QI and QIDA Orientation webinar and Introduction to CAP best practices /evidence webinar</td>
<td>• Collect data (up to 20 chart review or 100% of eligible patient charts if there are few than 20 charts) every 3 months retrospectively.</td>
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Wrap-Up & Data Analysis October 2016
**HOSPITAL SITE SELECTION**

All applications received will be reviewed by the project’s Expert Group, which is comprised of pediatricians with training and experience in pediatric hospital medicine, intensive care, and emergency medicine. Members of the expert group all have experience guiding previous pediatric quality improvement projects and advanced training in quality improvement methodology. Up to 25 pediatric hospital teams will be selected, representing a diversity of geographical locations, hospital settings (urban, rural, suburban), hospital size, and hospital type. An emphasis will be placed on recruiting hospitals that traditionally don’t have access to quality improvement resources and technical assistance.

A hospitalist physician must lead the project team. Applicants are expected to have identified a team and documented in the application the commitment of the senior leadership to support this project.

If selected, all core improvement team members will be asked to sign a consent form and the physician leader will be asked to join the Quality Improvement Innovation Networks (QuIIN), a program of the American Academy of Pediatrics. Joining QuIIN is free and easy and requires completion of a simple membership application available at [http://quiin.aap.org](http://quiin.aap.org).

**BENEFITS OF PARTICIPATION**

Participation in this nationally recognized project would provide many benefits to involved teams:

- Test strategies for improving UTI care for inpatients 7 days to 2 years of age
- Work with colleagues from around the country in a quality improvement learning collaborative
- Learn from national experts, including coaching from hospitalists with content expertise throughout a 15 month action period, and receive ongoing support for improvement
- Receive American Board of Pediatrics Part 4 Maintenance of Certification credit (if approved)

**SPECIFIC EXPECTATIONS**

As part of the QI project, it is important for a hospitalist to identify a core improvement team of 3 to lead the improvement efforts in the hospital. These team members are considered QI project participants as they are the individuals who will communicate with the Expert Group on a regular basis, are responsible for the data collection/entry, and will participate in education webinars with other hospital core improvement teams. They also relay information back to others in the hospital so that improvements to the system can be made. These team members will be consented to participate in the QI project and complete the duties outlined below.

Each participant on the core improvement team will:

**INITIALLY**

- **Physician leader only: serve as Local Leader in the attestation process required by the American Board of Pediatrics (ABP) for Part 4 Maintenance of Certification (if approved). Includes providing each hospitalist interested in participating for MOC credit a document describing the requirements of their participation, monitoring physician participation, and attesting that they met the project’s completion criteria.**
- Devote necessary resources and time to testing and implementing changes over the specified intervention period, while collecting data from up to 20 patient (or 100% of charts with a minimum of 3).
  - Baseline: Up to 60 charts over a 9 month period (September 2013 – May 2014)
  - 15 months of the action period divided by 3 months (September 2015 – August 2016)
- Achieve buy-in from hospital leadership to support the Q-UTI project (administration, IT, etc.)
- Obtain local institutional approval for participation in the project prior to any data collection (if necessary)

**PRE-WORK**

Complete pre-work activities (up to 8 weeks previous to the action period) including:

- Complete pre-survey via an online survey tool to provide a baseline assessment of UTI management at participating sites
Participate in a Project, QIDA & QI Orientation and preliminary introduction to change package Learning Session webinar (Webinar 1)

Group Administrator (person on the core team who will be responsible for data entry into QIDA) will view an on-demand webinar (Webinar 2) detailing the data entry process in QIDA (QIDA Webinar for Group Administrators).

Participate in Detailed Discussion of Change Package Learning Session webinar (Webinar 3)

Work as a team to gather the retrospective data for entry into QIDA that will count as the baseline data.
- Nine months of chart entry will be entered retrospectively, in three month increments during the pre-work period (a maximum of 20 charts per quarter, or 100% of eligible patient charts). Ultimately, the Group Administrator will enter chart data but gathering the charts for entry is the responsibility of the team.

**ACTION PERIOD**

- Learn the Model for Improvement and implement Plan, Do, Study, Act (PDSA) cycles.
- Implement appropriate changes in the process of how inpatient UTI care is delivered to patients.
- Regularly collect and submit clinical measurements pertinent to the aims of the project.
  - One core team member (identified as the Group Administrator) will enter chart review data into QIDA retrospectively for each quarter during the action period, as well as an initial four quarters of retrospective data that will count as the baseline data during the pre-work period.
- Review charts of up to 20 patients (or 100% of eligible patients that quarter if fewer than 20 eligible patients with a minimum of 3 charts) who are 7 days to 24 months of age hospitalized for UTI and collect data on project measures for 3 three-month periods retrospectively.
- Complete a narrative progress report up to four times during the action period via an online survey tool such as SurveyMonkey
- Test innovations in care delivery to improve care of children with UTI.
- Communicate on a monthly basis (and as needed) with an expert coach that will be assigned to each site throughout the action period via email, text or phone. The coaches will be assigned in the first month of the Q-UTI project based on your particular intervention interests.
- Share lessons learned and problem solve with other participating hospitals through an e-mail listserv and with other sites working with the project coach.
- Sites will review their data together periodically with their assigned expert coach. In an attempt to enhance collaborative learning within the project, sites that are similar based on region, size and other site demographics will be grouped at the beginning of the project and these groups will be organized into “tags” within QIDA allowing these sites to view each other’s de-identified run charts. Tagged site groups will review their data together on a periodic basis with their respective coach.
- Use e-mail and the Internet on a regular basis for ongoing support, information, and communication among hospital site teams.
- Participate in up to five live and/or pre-recorded learning session webinars (Webinar 4, 5, 6, 7, and 8) during the action period. The learning session topics for discussion and presentation include reviewing data, change package tools and strategies, what has worked and what has not, as well as how to sustain improvements and ‘hold the gains’
- Complete a post-survey via an online survey tool at the end of the project

**WRAP-UP**

(Optional) Participate in the VIP Network Business Meeting at the annual Pediatric Hospital Medicine (PHM) Conference, in July/August 2016, date and time to be determined in order to celebrate the near-end of the Q-UTI project.

**ABP MOC PART 4 ELIGIBILITY CRITERIA**

All physicians in the hospital are encouraged to participate in this project by using the tools and strategies identified and providing charts for review. If approved by the American Board of Pediatrics (ABP) for Part 4 Maintenance of Certification (MOC), physicians who would like to claim credit (including those not identified on the core improvement team), must meet the criteria established by the AAP and the minimum standards set by the ABP for all QI projects outlined below. The application for approval to award ABP MOC Part 4 points is not yet approved.

**AAP-Established Minimum Criteria for Participation**

- The project requires physician participation for 15 months. Physicians must:
  - Lead the implementation for the Quality Improvement for the Management of Children Hospitalized with Urinary Tract Infection (Q-UTI) project core changes for 15 months
  - Provide direct or consultative care to patients as part of the project
Physician Leader: Attend 4 meetings that can be learning session webinars or conference calls/webinars where collaborative data are reviewed or plans for new improvement activities are made.

Other participating physicians: Attend at least 4 meetings at which collaborative data are reviewed and plans for improvement activities are made (can be local team meetings, conference calls/webinars, or learning sessions)

- Collect and submit data on a subset of patients as defined by the project
- Review periodic (3-month) run charts
- Implement change package ideas/tools designed to improve UTI care

ABP Minimum Standards for Participation for All QI Projects
- Provide direct or consultative patient care in the improvement project
- Complete 1 or more tests of change to improve care
- Collect, submit and review data in keeping with the project’s measurement plan
- Collaborate actively by attending at least 4 project meetings
- Maintain active in the project for the minimum duration required by the project (minimum criteria established by AAP)
- Complete participation under current ABP certificate or MOC cycle

**DATA SHARING & REPORTING**

No identifiable patient data is collected as part of this project. As part of the quality improvement project, participants will share data with project participants and leadership. This will allow hospitals to learn from one another and share strategies and barriers. QuIN Expert Group members and Coaches (consisting of AAP staff and up to 12 expert leaders and coaches) will have access to data (by hospital) from the chart reviews, pre- and post-surveys and the progress reports, allowing them to ascertain areas of need and provide ongoing assistance throughout the project. Finally, hospital team members may choose to share data with other hospital staff (that are not consented) during webinars if they feel it will be beneficial (although this is not required).

For quality improvement purposes between hospitals, run chart data will be aggregated by hospital. In addition, hospitals will be identified by code in communication for quality improvement purposes between each participating hospital. Each participating team will be able to use the secure password protected QIDA system to view reports of their hospital’s aggregate data, as well as aggregate data from other hospitals. Data collected will not include protected health information. Data will be stored on a secure network with password protection. Project data will be stored indefinitely in the QIDA system, but once a project closes, only AAP QIDA staff will have access to the data.

For research and publications that may result from this work, individual hospital data or anecdotal stories will not be identifiable. If hospital data is presented, each hospital will receive an ID code in the report. Should hospitals be easily identifiable by their demographics (i.e., only one rural hospital or only one academic/university affiliated hospital with pediatric beds), data based on those demographics will not be presented in the publications or with the public. For instance, there will need to be three or more hospitals in any demographic group to report project data from that group in a publication or in any way to the public. Potential publications may include a conceptual model of key barriers and potentially useful strategies that emerged from this project. No patients or hospital staff will be identified in any report or publication about this study. Hospital names will only be used in the acknowledgement section of any potential publication.

**AAP INSTITUTIONAL REVIEW BOARD (IRB)**

The Q-UTI has received approval from the AAP Institutional Review Board. No identifiable protected health information is being collected for this project; therefore, HIPAA authorization will not be needed from patients in order for your hospital to participate. Note: your hospital or healthcare system may also require IRB approval. Often, the information supplied in the AAP IRB Application will be applicable to your own hospital IRB application as well and may be sufficient. If not, the AAP IRB application will be provided so that it can be adapted to meet your needs; a copy of the full AAP IRB protocol and approval letter are attached with this recruitment information.
APPLICATION CHECKLIST

- Please review the following documents:
  - Recruitment Materials
  - Electronic Application (Include link)

- After reviewing the above materials, please submit the electronic application by June 15, 2015, for full consideration.

- If you are interested in obtaining a letter of support from the Q-UTI leadership that can be shared with the leadership at your organization, please contact Faiza Khan with this request.

- Upon our receipt of your application materials, the application will be reviewed by the Expert Group. Once project teams have been selected, we will contact you to welcome your team to the project. Selected hospitals will be notified by late June.

- Please do not hesitate to contact Faiza Wasif, MPH, QuIN Project Manager: fwasif@aap.org or 847/434-7806 with any questions.

We look forward to working with your team!