

# Pediatric Surgery Quality Collaborative

February 24, 2022



Hello everyone and welcome! We really appreciate your continued interest in this collaborative and look forward to getting started. First we will start with a few housekeeping reminders:

- 1) To reduce the likelihood of feedback during the call, we've muted everyone.
- 2) Please use the chat function to ask questions. We have time at the end of the presentations to respond to any questions submitted during the webinar, and, we'll open to a Q&A format at the end
- 3) The webinar is being recorded. We will post it later and provide a link so you can review or share with any member of your team unable to be on the call. Please frame any questions with the understanding it will be part of the recording.

# Meeting Agenda

- Welcome- Fisher
- PSQC Updates- Lally
- Case Studies
  - Grant Geissler- St. Joseph's Tampa
  - Monica Lopez and Barron Frazier- Vanderbilt
  - Q&A



Here is our agenda for today.

- 1) Welcome
  - 1) Introduce new PSQC member hospitals since our last meeting in November 2021
- 2) PSQC Updates
  - 1) Project #1-CT reduction pre-op
  - 2) Project #2-CT reduction post-op
  - 3) Project #3-Antibiotic Stewardship
  - 4) Project #4-PSQC Pilot Projects
- 3) Case Studies
  - 1) St. Joseph's Tampa
  - 2) Vanderbilt
  - 3) Q&A

# Welcome!

New York	Texas
New York Presbyterian Morgan Stanley, Jen DeFazio	Children's Medical Center Dallas, Lauren Gillory
North Carolina	
Levine Children's, Andrew Schulman	



Second-welcome to our new PSQC member hospitals. We are now 82 members strong.



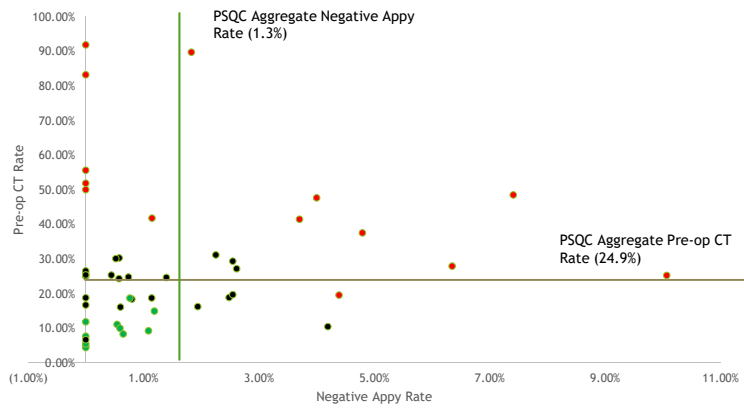
## PSQC Brief Update



Kevin Lally, MD, MS, FACS  
PSQC Executive Director  
Surgeon-in-Chief, Children's Memorial  
Hermann Hospital  
Houston, TX



## Project #1-CT reduction pre-op appy

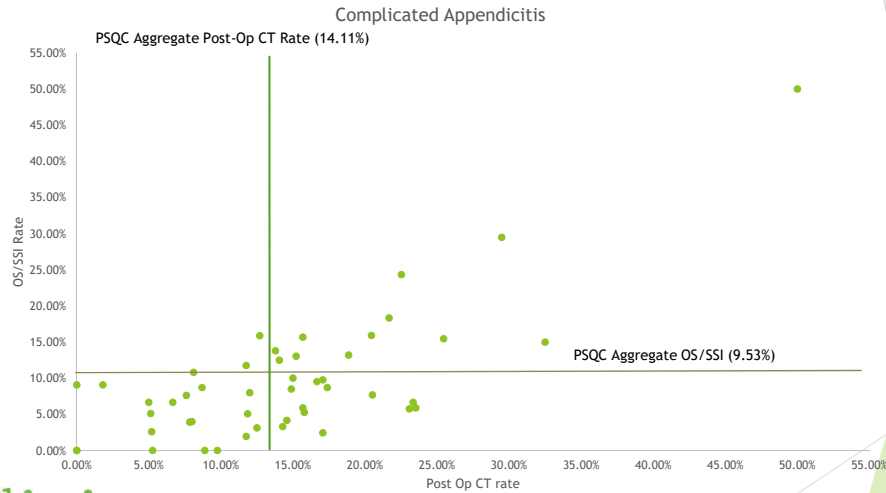


Children's  
MEMORIAL  
HERMANN  
Hospital

UTHealth  
The University of Texas  
Health Science Center at Houston  
McGovern  
Medical School

This graph is from our July 2021 SAR. We continue to wait for our January SAR. We don't anticipate seeing changes in the above before July 2022 SAR.

## Project #2-CT reduction post-op appy



Children's  
MEMORIAL  
HERMANN  
Hospital

UTHealth  
The University of Texas  
Health Science Center at Houston

McGovern  
Medical School

NSQIP supplied some preliminary data to us on the post-op CT scan rate for the 47 hospitals included in the July PSQC SAR and the corresponding organ space and SSI rate. This project will focus on reducing the use of CT post-op with a balancing measure of maintaining or reducing SSI incidence. Project leads are Monica Lopez from Vanderbilt and Derek Wakeman from Golisano.

## Project #3-Antibiotic Stewardship

- ▶ Project Lead: Shawn Rangel, Boston Children's
- ▶ Anticipate first data in fall 2022
- ▶ Will be reaching out for workgroup members



This project will make use of the antibiotic data each site has been entering into NSQIP since January 1, 2021. We need to review the data before we set the objective of the project but we have little doubt there will be plenty of opportunity for QI in the data set.



# PSQC Pilot Project Submission Form

Current instrument: **PSQC Pilot Project Submission Form v. 2.0** [Return to edit view](#)

**NOTE:** Please be aware that branching logic and calculated fields will not function on this page. They only work on the survey pages and data entry forms.

**Record ID**

Please consider the difference between research and quality improvement as you formulate your answers. The goal of research is to add to the knowledge base or generate new knowledge through testing of a hypothesis. The goal of QI is to improve practices based on the best available knowledge.

**First Name**

**Last Name**

\* must provide value

**Institution**

\* must provide value

**Email**

\* must provide value

**What is your QI project title?**

\* must provide value

**What data would you use from your current SAR to get started? (i.e. category, model, etc.)**

\* must provide value

**How will you measure success?**

\* must provide value

**Does your SCR have the time to participate in any additional abstraction needs for this project?**

\* must provide value

**Are there any hospitals within the PSQC you feel would be good partners on this project?**

\* must provide value

**Please list the hospitals here.**

\* must provide value



Our 4<sup>th</sup> project will be completely PSQC generated. We are asking you, our members, to consider projects you feel will lend themselves to a quality improvement approach and have a wide ranging effect on pediatric surgery outcomes. The submission form is live and Terry will share the link when she sends out the slides after this meeting.

# Case Studies with PSQC CT Reduction Implementation Guide



Grant Geissler, MD, FACS, FAAP  
Chair, Process Improvement and Patient Safety  
St. Joseph's Hospital of Tampa



# Pediatric Appendicitis: Improved Outcomes from Diagnosis to Discharge

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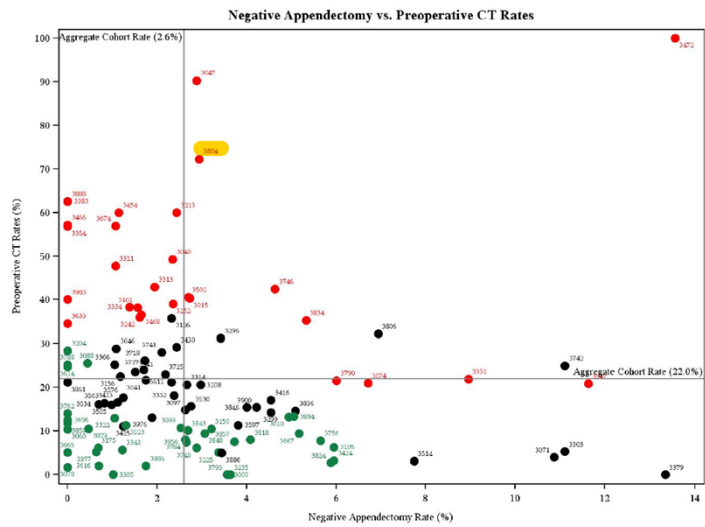
*Dr. Grant Geissler, MD, FACS, Medical Director of  
Children's Surgery*

*Kirsten Yancy, RN, BSN, CPN  
Children's Surgery Program Coordinator*



## Background

- A review of the 2017 Semi-Annual Report for NSQIP Pediatrics appendicitis data showed a high rate of CT scanning as the initial imaging study, a low use of US before CT, and a high rate of Negative Appendectomy vs. Preoperative CT Rates.



## Background

- In addition, St. Joseph's Children's Hospital was high (Needs Improvement) for surgical site infection (SSI) rate when compared with national averages.

### Targeted - Appendectomy Complicated

	Total Cases	Observed		Pred Obs Rate**	Expected Rate	Odds Ratio	95% CI		Outlier	Decile	Adjusted Percentile	Adjusted Quartile	Assessment*
		Events	Rate				Lower	Upper					
T APPY Comp OS SSI or Drainage/Aspiration	40	10	25.00%	21.20%	12.52%	1.91	0.98	3.75		9	82	4	Needs Improvement
T APPY Comp Revisit	40	6	15.00%	14.01%	13.57%	1.04	0.63	1.71		6	54	3	As Expected
T APPY Comp Emergency Department	40	6	15.00%	13.54%	12.85%	1.06	0.63	1.78		7	56	3	As Expected
T APPY Comp Readmission	40	4	10.00%	7.89%	6.98%	1.14	0.60	2.18		9	61	3	As Expected
T APPY Comp Morbidity	40	6	15.00%	13.11%	10.33%	1.31	0.63	2.73		7	65	3	As Expected
T APPY Comp SSI	40	6	15.00%	10.84%	6.36%	1.81	0.83	3.94		10	80	4	Needs Improvement

### Targeted - Appendectomy Uncomplicated

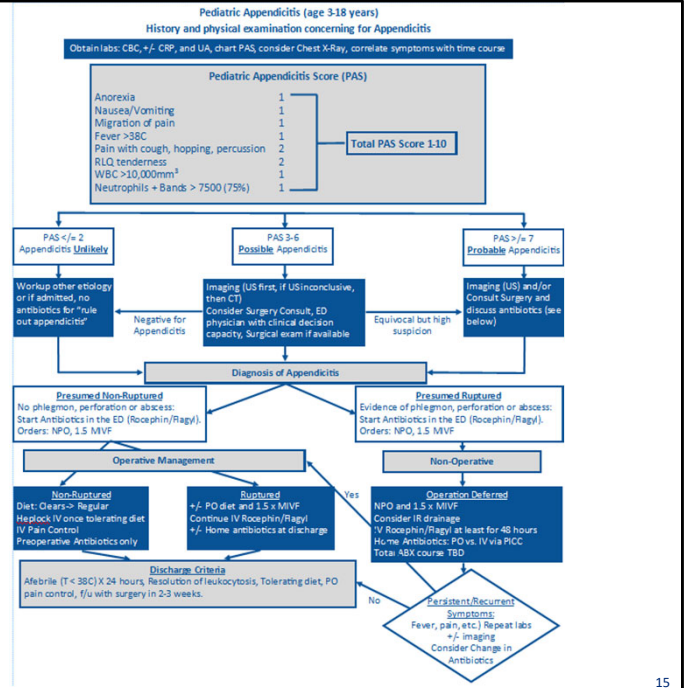
	Total Cases	Observed		Pred Obs Rate**	Expected Rate	Odds Ratio	95% CI		Outlier	Decile	Adjusted Percentile	Adjusted Quartile	Assessment*
		Events	Rate				Lower	Upper					
T APPY Uncomp OS SSI or Drainage/Aspiration	164	3	1.83%	1.20%	0.83%	1.46	0.59	3.65		9	70	3	As Expected
T APPY Uncomp Revisit	164	6	3.66%	5.42%	6.81%	0.78	0.51	1.21		1	26	2	As Expected

## Process

1. Decrease CT usage by following PAS score to stratify risk.
2. Increase US before CT, increase overall US usage and decrease overall CT usage.
3. Decrease surgical site infections in complicated appendicitis patients by implementing a standardized approach from diagnosis to treatment to intraoperative grading, operative technique, and unified post operative care guidelines.

# Process

- Multidisciplinary Collaborative including ER, Radiology and Surgery developed the diagnostic appendicitis algorithm, focusing on the PAS score before imaging.



## Process

- Evidence Based Medical (EBM) Team created a Clinical Standard

### **BayCare Best Practice Medical Standard**

#### **Reduction of CT use in Evaluating for Pediatric Appendicitis**

Developed by: **Children's Service Line**  
Endorsed by: **ED Collaborative**

- EBM created a power plan in the EMR that included the diagnostic algorithm and required the PAS score to be entered prior to ordering a CT scan
- EBM rolled out clinical standard and power plan to all 13 BayCare EDs which saw 131,750 pediatric patients in 2019.



# Process

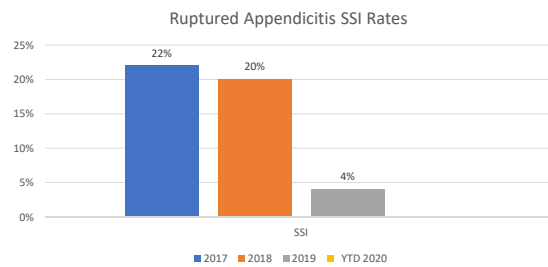
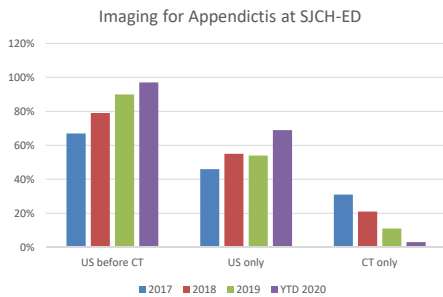
- Pediatric Surgeons met and formalized an intraoperative standardization of care based on an article published in December 2017 Journal of Pediatric Surgery “Standardization of care for pediatric perforated appendicitis improves outcomes” by Yousef at McGill Montreal Children’s Hospital (JPS, Vol 52, NO 12, Dec 2017, pp1916-1924).

## Intraoperative Assessment and Standardization of Care for the Pediatric Patient with Perforated Appendicitis

<b>Intraoperative Phase:</b>	
<p><b>2. Grade of perforated appendix</b></p> <p>Grade 1: Early or contained perforation <input type="checkbox"/></p> <p>Grade 2: Contained abscess with no diffuse peritonitis <input type="checkbox"/></p> <p>Grade 3: Generalized peritonitis with no dominant abscess <input type="checkbox"/></p> <p>Grade 4: Generalized peritonitis with one or more dominant abscesses <input type="checkbox"/></p>	<p><b>3. Surgeon to document:</b></p> <p>Free fecalith encountered and removed <input type="checkbox"/></p> <p>Severe intestinal dilation <input type="checkbox"/></p>
<b>4. Complete Checklist:</b>	
<p>1. Culture pus from abdomen <input type="checkbox"/></p> <p>2. Fecalith identified on preoperative imaging retrieved: <input type="checkbox"/></p> <p>3. Free fecalith removed intact <input type="checkbox"/></p> <p>4. Inspect omentum to confirm no contained fecalith or appendiceal portion <input type="checkbox"/></p> <p>5. All 4 quadrants inspected and purulent fluid suctioned: <input type="checkbox"/></p> <p>6. Perihepatic space inspection purulent fluid suctioned: <input type="checkbox"/></p> <p>7. Retract recto sigmoid out of pelvis and suction cul de sac <input type="checkbox"/></p> <p>8. Run the bowel and evacuate intraloop abscesses <input type="checkbox"/></p> <p>9. Confirm removal of entire appendix <input type="checkbox"/></p>	<p><b>Postoperative Phase:</b></p> <p>Consider Changing antibiotic coverage per culture results in a patient who shows poor response to therapy.</p>
<b>Complicated Pathway:</b>	
<p>5. Patient with persistent leukocytosis despite resolution of fever and/or ileus and bowel obstruction; recommend receiving 5 days of IV antibiotics. <input type="checkbox"/></p> <p>6. TPN is recommended for Grade 3 or 4 perforations and severe ileus or bowel obstruction, consider a PCC line.</p> <p>7. Imaging for postoperative abscesses should not be performed prior to the 7th postoperative day.</p> <p>8. First postoperative imaging modality is ultrasound, ask for the following:</p> <ol style="list-style-type: none"> <li>1. Presence or absence of abscess <input type="checkbox"/></li> <li>2. Single or multiple abscesses <input type="checkbox"/></li> <li>3. Largest dimension of single abscess or largest of multiple abscesses <input type="checkbox"/></li> <li>4. Volume of single abscess or total volume of multiple abscesses <input type="checkbox"/></li> <li>5. Presence or absence of fecalith <input type="checkbox"/></li> <li>6. Presence or absence of distended bowel <input type="checkbox"/></li> </ol> <p>9. Percutaneous drainage of postoperative abscess should be used only if initial volume is &gt;100 cm<sup>3</sup> or lack of response to antibiotics with smaller abscess. <input type="checkbox"/></p>	

## Result- Phase 1

- From 2017 to 2019 St. Joseph’s Children’s Hospital (SJCH) increased US before CT from 68% to 90%, US only increased from 46% to 54%, and CT only decreased from 31% to 11%.
- Surgical complications from complicated appendicitis fell from 22% in 2017 to 4% in 2019.
- Surgical site infections fell from 6% in 2017 to 3% in 2019.



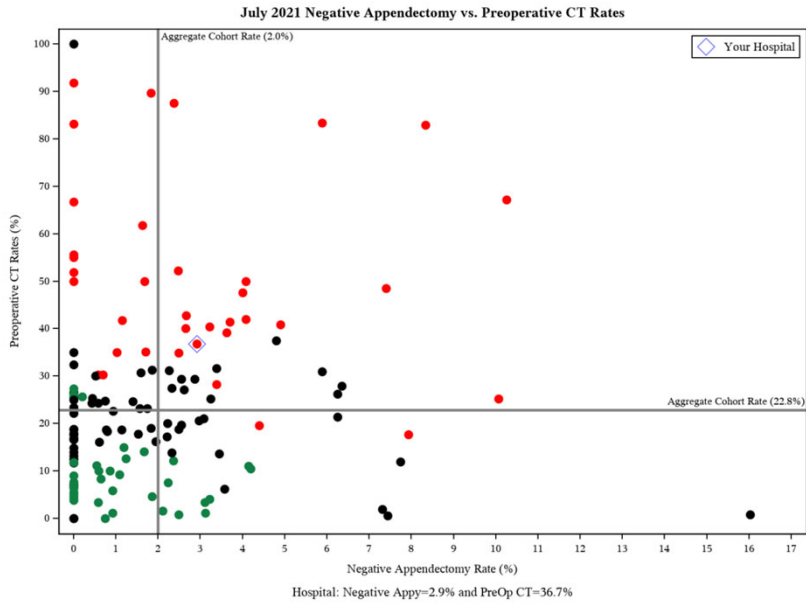
# NSQIP-Pediatric Results 7/1/20-6/31/21

## Targeted - Appendectomy Complicated

	Total Cases	Observed		Pred Obs Rate**	Expected Rate	Odds Ratio	95% C.I.		Outlier	Decile	Adjusted Percentile	Adjusted Quartile	Assessment*
		Events	Rate				Lower	Upper					
T APPY Comp OS SSI or Drainage/Aspiration	41	0	0.00%	5.96%	10.84%	0.51	0.22	1.15		1	16	1	Exemplary
T APPY Comp Revisit	41	5	12.20%	13.18%	13.48%	0.97	0.63	1.51		4	47	2	As Expected
T APPY Comp Morbidity	41	1	2.44%	6.05%	9.65%	0.60	0.25	1.42		2	25	1	Exemplary
T APPY Comp SSI	41	0	0.00%	5.20%	10.78%	0.45	0.18	1.11		1	15	1	Exemplary
T APPY Comp Length of Stay	41	4	9.76%	14.59%	22.66%	0.55	0.27	1.12		1	18	1	Exemplary
T APPY Comp Length of Stay (morbidity excluded)	40	4	10.00%	13.75%	18.67%	0.66	0.32	1.36		2	26	2	As Expected

## Targeted - Appendectomy Uncomplicated

	Total Cases	Observed		Pred Obs Rate**	Expected Rate	Odds Ratio	95% C.I.		Outlier	Decile	Adjusted Percentile	Adjusted Quartile	Assessment*
		Events	Rate				Lower	Upper					
T APPY Uncomp OS SSI or Drainage/Aspiration	106	0	0.00%	0.40%	0.45%	0.89	0.33	2.39		4	44	2	As Expected
T APPY Uncomp Revisit	106	3	2.83%	4.01%	4.61%	0.86	0.50	1.51		3	37	2	As Expected
T APPY Uncomp Emergency Department	106	3	2.83%	3.88%	4.46%	0.87	0.49	1.54		3	38	2	As Expected
T APPY Uncomp Readmission	106	0	0.00%	1.03%	1.32%	0.78	0.34	1.80		2	35	2	As Expected
T APPY Uncomp Morbidity	106	1	0.94%	1.49%	1.65%	0.90	0.43	1.88		4	43	2	As Expected
T APPY Uncomp SSI	106	1	0.94%	1.45%	1.61%	0.90	0.42	1.93		4	44	2	As Expected
T APPY Uncomp Length of Stay	106	1	0.94%	1.95%	4.97%	0.38	0.12	1.15		1	19	1	Exemplary
T APPY Uncomp Length of Stay (morbidity excluded)	105	1	0.95%	1.93%	4.83%	0.38	0.12	1.19		1	20	1	Exemplary

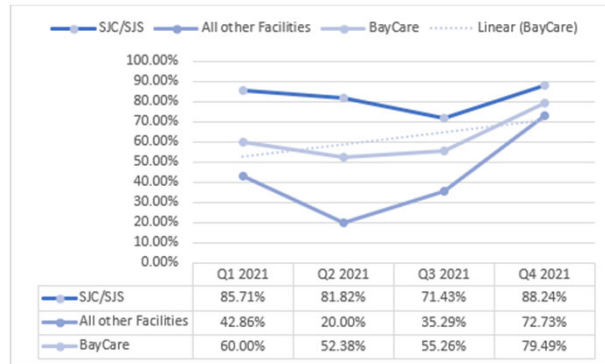


# NSQIP- Pediatric Results 2020

## CT Usage Results

- After reviewing NSQIP-Pediatric data and data from the analytics team findings included:
  - US before CT has increased
  - Still large number of patients receiving CT scans

US performed prior to CT in Pediatric Appendicitis



## Phase 2- Further Decrease CT usage

- PSQC presented Implementation Guide in August 2021
- Dr. Geissler sent email to ED and Radiology 8/24/21 with implementation guide and call to action
- Dr. Ihsan Mamoun- Pediatric Radiology Director-lead for Radiology
  - SJH Radiology: 35 board certified/fellowship trained providers
    - 3 pediatric radiologists, 1 pursuing pediatric certification via the alternative pathway through the American board of radiology
    - Fall 2021 Pediatric Radiology has a reading room M-F
  - Reviewed 6 months of US Appendicitis data
    - 33% of ultrasounds completed visualized the appendix and gave a definitive positive or negative finding
- Next Steps included:
  - Advanced training for US technicians to improve accuracy of identifying appendix (November 2021-January 2022)
  - Standardize US Appendicitis report (PSQC Implementation Guide)
    - Grade 1- Grade 4 utilizing *the Pathway for Management of Pediatric Patient with Right Lower Quadrant Pain and Suspected Appendicitis in the ED* that was published in the American Journal of Emergency Medicine in 2021
  - Provide education to all ED providers at the ED collaborative 2/11/22

## Lessons Learned

1. St. Joseph's Children's Hospital, within a large adult system, is making a large impact system wide. Performance Improvement Project Manager was essential to successful implementation across the large system.
2. ED communication and collaboration: buy-in for evaluation and risk stratification of abdominal pain patients, break down of barriers and previous expectations lead to success of roll-out.
3. Direct surgeon involvement in evaluation of patient and guaranteed clinical follow-up for low suspicion appendicitis patients reduces unnecessary studies and inpatient admissions.
4. Have IS involved early- needed to embed hard stop for CT order, PAS calculation, and algorithm population.
5. A consensual standardized surgical approach to complicated appendicitis led to lower surgical site infections.
6. Engagement in PSQC allowed sharing of implementation guide with Radiology group to show them initiatives in a national context.

## Case Studies with PSQC CT Reduction Implementation Guide



Monica E. Lopez, MD, MS, FACS, FAAP  
Vice Chair for Surgical Quality and  
Evidence-Based Systems  
Monroe Carell Jr. Children's Hospital at  
Vanderbilt



Steven Barron Frazier, MD  
3<sup>rd</sup> Year Fellow, Pediatric Emergency Medicine (PEM)  
Monroe Carell Jr. Children's Hospital at Vanderbilt





## REDUCING COMPUTED TOMOGRAPHY IMAGING IN A PEDIATRIC EMERGENCY DEPARTMENT FOR SUSPECTED APPENDICITIS

- Barron Frazier, MD Pediatric Emergency Medicine
- Monica E. Lopez, MD, MS Pediatric Surgery
- Martin Blakely, MD Pediatric Surgery
- Caroline Godfrey, MD General Surgery
- Anuradha Patel, MD Pediatric Surgery Research Fellow
- Marta Hernanz-Schulman, MD Pediatric Radiology
- Melissa Danko, MD Pediatric Surgery/NSQIP Champion
- Jenny Overfield, MD Pediatrics

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## BACKGROUND

- Appendicitis is a common pediatric surgical emergency
- Despite its frequency, there is significant practice variability for appendicitis, particularly at children-specific hospitals
- Despite many other diagnostic tools, computed tomography imaging continues to be used frequently
- Pediatric radiation exposure = increased lifetime risk of cancer
- Pediatric Surgery Quality Collaborative engaged members, particularly those who overutilize CT imaging, to use QI methodology to reduce this imaging modality for diagnosing this condition

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# PSQC IMPLEMENTATION GUIDE



## Reduction of CT utilization for Pre-op Imaging of Pediatric Appendicitis

Implementation Guide

### Aim Statement

By June 30, 2022, the aggregate CT utilization rate for the Collaborative will be reduced from 24.5% to 15%.

### Balancing Measure

The negative appendectomy rate for the Collaborative will remain at or below 1.75%.

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# PSQC IMPLEMENTATION GUIDE Intervention Strategies

**Key Driver 1:** Multidisciplinary approach to quality improvement using best practices in imaging

*Cultivate a workgroup with representation from key stakeholders*

**Key Driver 2:** Written protocol/algorithm for triage of suspected appendicitis in ED

*A written protocol/algorithm would incorporate a validated pediatric appendicitis assessment tool (PAS, Alvarado, etc.-see appendix) in any imaging decisions made in the ED for suspected appendicitis.*

**Key Driver 5:** Ultrasound report template in EHR

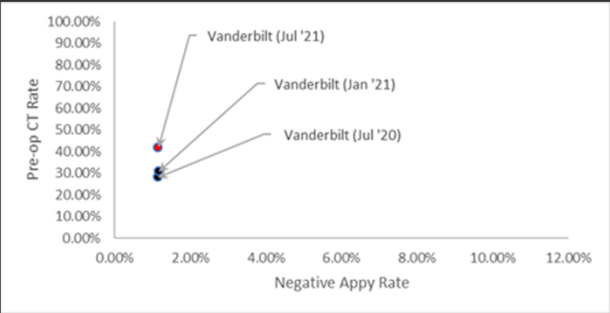
*Develop a standardized report for imaging for appendicitis embedded in the EHR*

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In preliminary review of the implementation guide, our group felt these change strategies were uniquely applicable in our setting and would fill existing gaps in our processes.

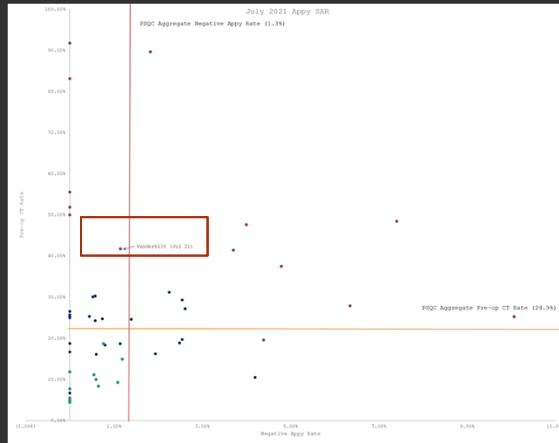
# CT UTILIZATION PERFORMANCE



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# CT UTILIZATION PERFORMANCE



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## SMART & GLOBAL AIMS

### Smart Aim

- To reduce CT utilization in the pediatric emergency department for the evaluation of children without underlying GI disease who present with suspected appendicitis from 32% to 15% by June 2022.

### Global Aim

- We will minimize radiation exposure in the evaluation of suspected intra-abdominal pathology.

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## BASELINE DATA/DATA PLAN

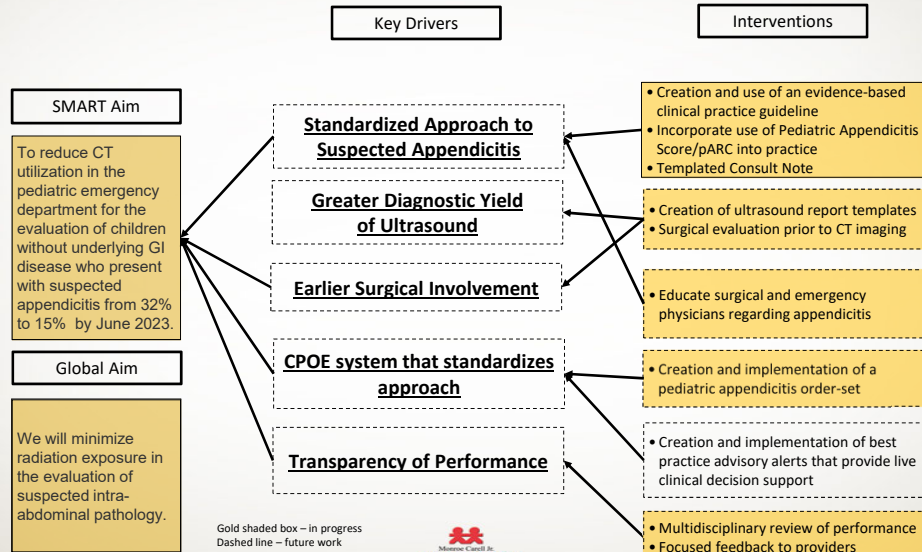
1. Numerator: **Computed tomography of abdomen/pelvis**
2. Denominator: **Patients with suspected appendicitis**
3. Interval Measure: **Cohorts of 30 patients**
4. Data sources: **Compiled data from Epic**
5. Measurement period: **2 years**
6. What's the frequency of the process you're measuring? **Weekly**
7. Baseline data? **11 months**
8. Inclusion: **Pediatric patients who have a final diagnosis of appendicitis OR any patient who undergoes a limited U/S to evaluate the appendix**
9. Exclusion: **Patients who are referred from an OSH with imaging or have underlying GI disease**
10. Process Measures: **PAS Score documentation, Radiology Template Usage**
11. Balancing Measures: **Negative Appendectomy Rate, ED LOS, Return within 72 hours with appendicitis diagnosis**

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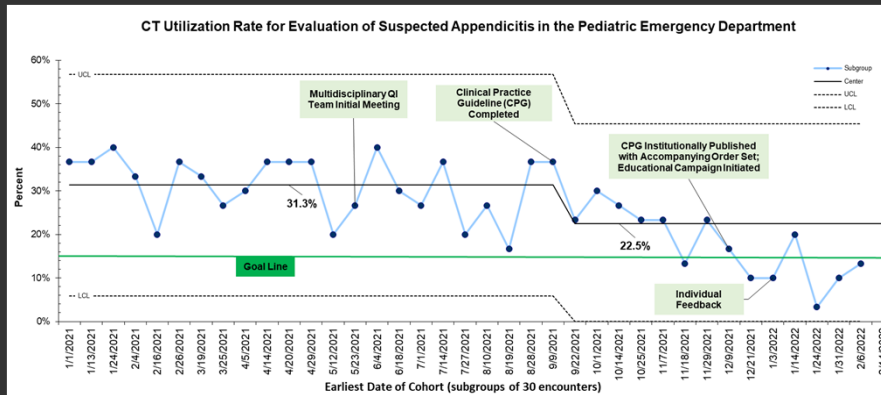




**Reducing computed tomography imaging in a pediatric emergency department for suspected appendicitis**  
Key Driver Diagram



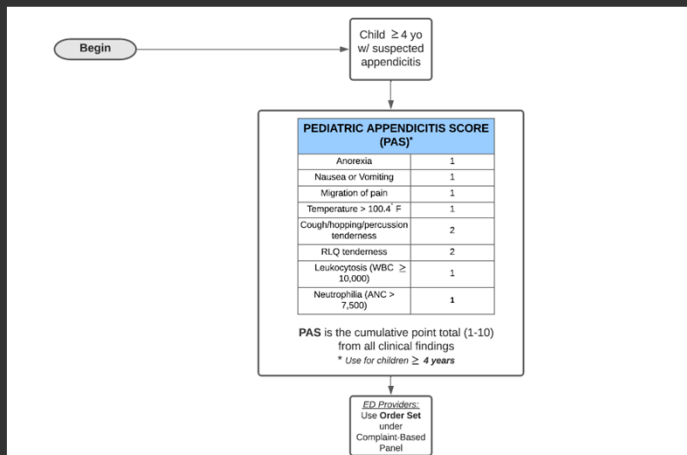
# P-CHART



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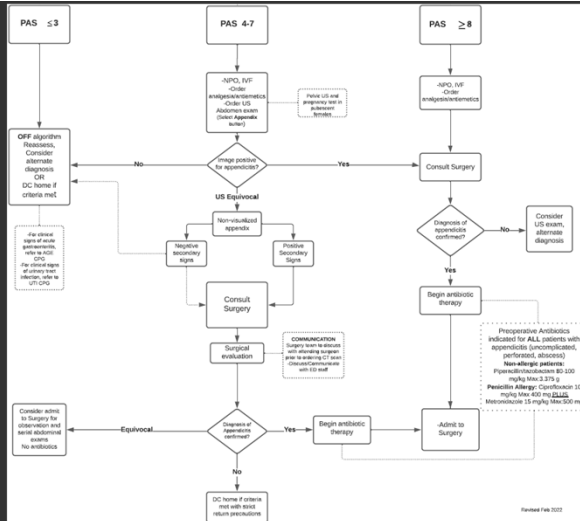
# INTERVENTIONS: CLINICAL PRACTICE GUIDELINE



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# INTERVENTIONS: CLINICAL PRACTICE GUIDELINE



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# INTERVENTIONS: COMPLAINT-BASED PANEL

The screenshot displays a web-based medical orders interface. At the top, there are navigation tabs: 'Quick List', 'All Orders', 'Signed & Held', 'Home Meds', and 'Order History'. Below these are filter buttons for 'Common Orders', 'Complaint Based Panels' (which is selected), 'Trauma', 'Imaging', 'Consults', 'Nursing Communication', and 'Post-Intubation & Agitation Protocols'. The main area is divided into three columns of order categories, each with a list of items and checkboxes:

- Left Column:**
  - Febrile Infant 0-29 Days Old
    - Febrile Infant 0-29 DAYS
  - Febrile Infant 29-60 Days Old
    - Febrile Infant 29-60 DAYS
  - Neonatal Hyperbilirubinemia
    - Hyperbil Step 1
    - Hyperbil Step 2
  - Pediatric Sepsis
    - Pediatric Sepsis
  - Febrile Neutropenic
    - Febrile Neutropenic
  - MIS-C
    - MIS-C Step 1
    - MIS-C Step 2 (Order if patient is unstable)
  - Orbital Cellulitis (Step 1 & 2)
    - Orbital Cellulitis - Initial Evaluation (Step 1)
    - Orbital Cellulitis Confirmed - Abx, Consults (Step 2)
- Middle Column:**
  - Anaphylaxis
    - Anaphylaxis
  - Asthma
    - Asthma
  - Appendicitis/RLQ Abdominal Pain
    - Appendicitis/RLQ Abd. Pain STEP 1
    - Appendicitis/RLQ Pain - Surgical Consult: STEP 2
    - OSH Referral for Appendicitis w/ CT Imaging
  - Community-Acquired Pneumonia
    - Community-Acquired Pneumonia
  - Bronchiolitis
    - Bronchiolitis
  - Sickle Cell Pain Episode
    - Sickle Cell Pain Episode
- Right Column:**
  - Pediatric Stroke
    - Pediatric Stroke
  - Acute Gastroenteritis
    - Acute Gastroenteritis
  - Hyperglycemia/DKA
    - Hyperglycemia/DKA
  - Status Epilepticus
    - Status Epilepticus
  - Suspected Child Physical Abuse
    - Suspected child physical abuse, less than 6 months
    - Suspected child physical abuse, 6-12 months
    - Suspected child physical abuse, 12-60 months
    - Suspected child physical abuse, greater than 60 months
    - Additional CASE Team specific orders
    - ED Sexual Assault

On the right side, there is a 'Manage Orders' and 'Order Sets' section. Below it is a 'New Orders' section with a dropdown menu set to 'New'. The 'New Orders' section shows a selected order: 'Appendicitis/RLQ Abd. Pain: STEP 1'. Below the order name, there is a 'STAT' indicator and a note: 'First occurrence today at 1415'. Further details include 'Block: Deliver within 4 hours of collection. Draw 2 mL tube to fill line. Ultrasonnd abdomen limited'. There are also 'STAT' and 'Once, First occurrence today at 1415' indicators, and a question 'Is the patient pregnant? Unknown'. At the bottom of the sidebar, there are buttons for 'Remove All', 'Save Work', and 'Sign'.

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# INTERVENTIONS: COMPLAINT-BASED PANEL

Appendicitis/Rt Q Abd, Pain: STEP 1 ✓ Accept

**Please defer all CT imaging until after pediatric surgery consultation and final recommendations. Please refer to CPG for guidance.**

**CBC w/ Differential**  
 STAT, First occurrence today at 1415 P  
 Blood, Deliver within 4 hours of collection. Draw 2 mL tube to fill line.

**Ultrasound abdomen limited**  
 STAT, Once, First occurrence today at 1415  
 Is the patient pregnant? Unknown

**Urinalysis with Reflexive Culture**  
 Urine cultures are indicated for:  
 - Known or suspected UTI based on a signs and symptoms or with atypical presentation  
 - Known or suspected sepsis without a clear source  
 - Screening for bacteria in pregnant women and patients undergoing urologic procedures

Do NOT order urine cultures  
 - Based on changes in urine quality (urine color/ smell, presence of sediments)  
 - As screening or routine orders without indications and/or symptoms (Exceptions are noted below)  
 - To document clearance of bacteriuria in the presence of symptomatic improvement

False positive/contaminated urine cultures can lead to unnecessary treatment and potential harm. For most patients, a UA should be performed to guide whether a urine culture is indicated ("UA with reflexive culture"). For some patients, treatment of a positive urine culture is indicated regardless of UA results.

**Exclusion criteria for UA with Reflexive Culture:**  
 - Less than 25 months of age  
 - Currently pregnant  
 - Scheduled for urologic procedure  
 - Neutropenic (ANC < 100 or total WBC < 500)

If patient meets criteria, order either Urinalysis and a urine culture, or ONLY the urine culture. If patient DOES NOT meet criteria, order the urinalysis with reflex culture.

Patient needs UA with Reflexive Urine Culture

**Urinalysis w/Micro&Rfx Culture**  
 Once, First occurrence today at 1415 P  
 Urine, Specimens cannot be shared with any other tests. Deliver to lab immediately.

Patient meets exclusion criteria

Urine Pregnancy Test  
 STAT

Additional Diagnostic Labs/Imaging

Ⓞ Next Required ✓ Accept

DOING BETTER.



# INTERVENTIONS: COMPLAINT-BASED PANEL

Neonatal Hyperbilirubinemia  
 Hyperbill Step 1  
 Hyperbill Step 2

Pediatric Sepsis  
 Pediatric Sepsis

Febrile Neutropenic  
 Febrile Neutropenic

MIS-C  
 MIS-C Step 1  
 MIS-C Step 2 (Order if patie

Orbital Cellulitis (Step 1)  
 Orbital Cellulitis - Initial Eval  
 Orbital Cellulitis Confirmed

Appendicitis/RLQ Abdominal Pain  
 Appendicitis/RLQ Abd. Pain: STEP 1  
 Appendicitis/RLQ Pain - Surgical Consult: STEP 2

Hyperglycemia/DKA  
 Hyperglycemia/DKA

Status: Enteritricus

Appendicitis/RLQ Pain - Surgical Consult

Inpatient Consult to Pediatric Gen surg. Trauma

Reason for Consult: (This will go to the Consult team pager --Limit text to 140 characters or less--): Surgical Evaluation for Appendicitis, PAS Score \*\*\*  
Team requests consultant to enter orders appropriate to the consultation? Yes  
Team requests consultant to contact team member BEFORE seeing the patient? Yes

Reason for Consult: (This will go to the Consult team pager --Limit text to 140 characters or less--):  
Surgical Evaluation for Appendicitis, PAS Score \*\*\*

Please enter the Phone / Pager number you want to be called back at: (Ten digit numbers only)

Team requests consultant to enter orders appropriate to the consultation?  
 Yes  No

Team requests consultant to contact team member BEFORE seeing the patient?  
 Yes  No

Comments:  Please communicate recommendations in person or by phone.

Inpatient Consult to Pediatric Surgery - Ovarian Torsion  
 Inpatient Consult to Pediatric Surgery - Other

Next Required

Accept  Cancel

DOING BETTER.



## OTHER & FUTURE INTERVENTIONS

- Standardized Ultrasound Interpretation Templates (February 2022)
- Individual Feedback for Ongoing Process Learning/Refinement (January 2022)
- Biweekly meetings to review data with QI team
- Surgical Consult Note Templates

DOING BETTER.





## LESSONS LEARNED

- Changing culture is difficult, particularly when transitioning from imaging-confirmed appendicitis to clinical prediction tool logic
- COVID-19's abdominal pain presentation led to a period of skepticism when evaluating children with suspected appendicitis
- Engaging other subspecialties can take time and requires 'patient persistence'
- Ongoing process learning is important to learn unforeseen process failures and establish potential solutions

DOING BETTER.



# THANK YOU!

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DOING BETTER.



# Questions



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The slide deck and a link to the recording of this webinar will be forwarded to all as soon as it is available. It will also be posted on our website.