246 A Pre-Operative Clinical Scoring System to Distinguish Perforation Risk With Pediatric Appendicitis

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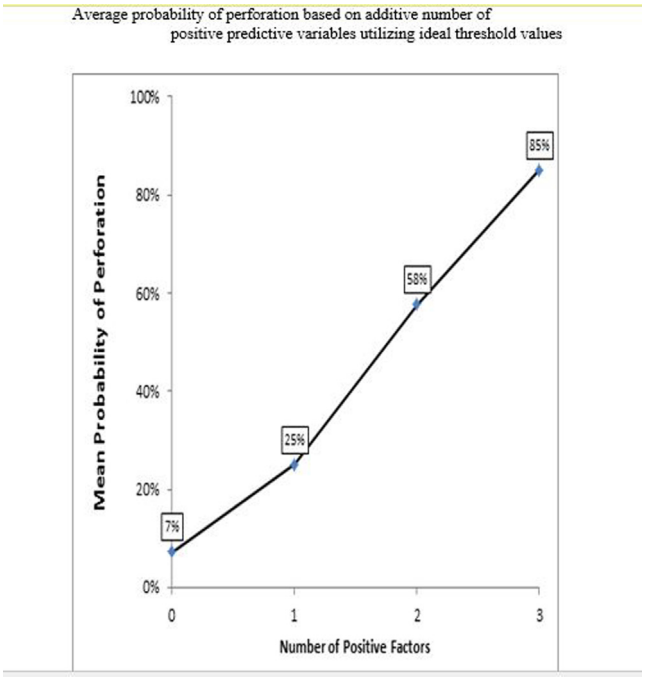
Study Objectives: To determine efficacy of commonly assessed pre-operative variables in stratifying perforation risk in children with appendicitis.

Methods: Design: Retrospective analysis of consecutive cases. Setting: A large urban hospital pediatric emergency department. Participants: 448 consecutive cases of CT-confirmed pediatric appendicitis during a 6-year period: 162 with perforation and 286 non-perforated. Main Outcome(s) and Measure(s): To correlate clinical and laboratory variables with distinguishing perforation outcome in children with appendicitis.

Results: Regression analysis identified 3 independently significant variables associated with perforation outcome - and determined their ideal threshold values: *duration of symptoms greater than 1 day; ED-measured fever [body temperature greater than 38.0°C]; CBC WBC absolute neutrophil count greater than 13,000/mm^3*. The resulting multivariate ROC curve after applying these threshold values gave an AUC of 89% for perforation outcome [p <0.001]. Risk for perforation was additive with each additional predictive variable, linearly increasing from 7% with no variables present, to 85% when all 3 variables are present.

Conclusions: A combination of 3 commonly assessed pre-operative clinical/laboratory variables generates a useful pre-operative scoring system to stratify perforation risk in children with appendicitis.



247 Performance of Clinical Gestalt in Predicting Pediatric Appendicitis: Does Experience Matter?

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Study Objectives: Appendicitis is the most common surgical emergency in children and delays in diagnosis are associated with increased morbidity. Clinical prediction tools can risk stratify patients presenting to the ED with abdominal pain based on symptoms, findings and laboratory results. Gestalt, a synthesis of provider experience and clinical perception, is reported to perform as well as these prediction tools, but has not been well studied. We evaluated the performance of clinical gestalt as a predictor of pediatric appendicitis and stratified on provider characteristics.

Methods: Attending emergency physicians prospectively enrolled patients aged 5-20 years with suspected appendicitis in an electronic health record (EHR)-based risk stratification tool, entering patient characteristics and symptoms; laboratory data (white blood cell and absolute neutrophil count) was imported from the EHR. Prior to imaging, physicians entered their gestalt for appendicitis on a continuous scale (0-100%). The primary outcome, acute appendicitis, was identified using diagnosis and procedure codes and confirmed by chart review. We calculated the receiver operating characteristic (ROC) curve for gestalt as a continuous variable overall and stratified by provider experience and sex.

Results: Of 1000 eligible patients, 800 (80%) were enrolled; patients with gestalt entered after imaging had been ordered were excluded. Their median age was 10 years (IQR 7-14) and 11.7% had appendicitis. Of 281 enrolling physicians, the mean age was 41, with 86% of respondents between 30-49 years and 11% less than 5 years out of residency (mean 12 years post residency); 40% were female. The overall c-statistic for gestalt as a predictor of appendicitis was 0.89. Among physicians with < 5 years experience, the c-statistic was 0.77 versus 0.91 among more experienced physicians. The c-statistic increased with experience for both male and female physicians from 0.81 to 0.91, and 0.70 to 0.89, respectively. The rate of appendicitis in patients in the lowest gestalt category (0-10%) was 0.33%, while in the highest gestalt category (90%-100%), it was 68.8%.

Conclusions: In this prospective study, clinical gestalt performed well in predicting appendicitis in children, especially at extremes of appendicitis risk.

248 A Clinical Pathway for the Management of Febrile Infants Ages 29-60 Days Improves Antimicrobial Stewardship

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Study Objectives: Despite almost universal agreement on management of febrile infants less than 28 days of age, there still exists great variability in the evaluation and treatment of patients aged 29 to 60 days old. We evaluated the impact of a clinical pathway for febrile infants aged 29 to 60 days old on variation in antibiotic administration practices within the emergency department (ED).

Methods: Development of an evidence-based clinical pathway to risk stratify infants for presence of a serious bacterial infection (SBI) based on modified Rochester Criteria occurred over an 18-month period. Education on the clinical pathway was provided to emergency medicine and hospital medicine attending physicians; pediatric emergency medicine fellows; pediatric, emergency medicine and family practice residents; and emergency department nurses around the time of implementation in July 2016. Monthly educational emails were sent to residents rotating through the pediatric ED. Additionally, an electronic ED order set was developed and employed in October 2016, and a ceftriaxone order panel with pre-populated dosing recommendations was employed in April 2017. Quality metrics were developed based upon the pathway objective of evaluating and managing febrile infants and included clinical presentation, laboratory studies, antibiotic administration, antibiotic selection and dosing, presence of an SBI, and final disposition. Pre-pathway quality metrics were gathered from April 2014 to July 2016. Post-pathway quality metrics were gathered from July 2016 to April 2017.

Results: With implementation of the pathway, overall antibiotic usage decreased from 47% to 34%. Prior to the pathway, infants stratified as low-risk for SBI frequently received antibiotic therapy not indicated by the pathway. Post-pathway implementation showed a reduction in the percentage of low-risk infants receiving antibiotics from 27% to 1.4% (p=0.0001). Prior to the pathway, there was significant variation in the antibiotics administered, with 21% of infants prescribed antibiotics other than those recommended by the pathway. After pathway implementation, the variation in antibiotic administration dropped to 1%. The rate of missed serious bacterial infections did