Reader Performance in Evaluating Acute Appendicitis on Abdominal CT

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Purpose and Rationale

This project focuses on improving radiologists' performance on the interpretation of abdominal CT performed to diagnose acute appendicitis.

CT is often used in patients with suspected appendicitis, and has been shown to reduce the rate of negative appendectomy. Incorrect "over-diagnosis" of appendicitis on abdominal CT can lead to unnecessary surgery, which may result in morbidity and costs. Improving performance of abdominal CT interpretation would be beneficial.

Project Resources:

1. Accuracy of Nonfocused Helical CT for the Diagnosis of Acute Appendicitis: A 5-Year Review. Raman SS, Lu DSK, Kadell BM, Vodopich DJ, Sayre J, Cryer H. *AJR* 2002; 178: 1319-1325
2. Effect of Computed Tomography of the Appendix on Treatment of Patients and Use of Hospital Resources. Rao PM, Rhea JT, Novelline RA, Mostafavi AA, McCabe CJ. *NEJM* 1998; 338: 141-146

Project Measures

Metric 1

Numerator:	# of patients who underwent appendectomy for suspected acute appendicitis based on an abdominal CT scan interpretation and were found to have acute appendicitis on surgical pathology.
Denominator:	# of patients who underwent appendectomy for suspected acute appendicitis based on an abdominal CT scan interpretation

Baseline Data Collection

Identify a data collection strategy, for example, using the institutional surgical pathology database or electronic health record. Identify and review all patients over a period of time (e.g., in the past year) who underwent appendectomy for suspected acute appendicitis following a CT scan that was interpreted as being positive for acute appendicitis. This group constitutes the study data set.

Determine the number of cases to collect. This will be based in part on the nature and size of your practice; however, ideally at least 30 cases should be included in the study set.

Data Analysis

The goal is to identify the percentage of cases in which the interpreting radiologist suggested that a patient had acute appendicitis, and the patient subsequently went to appendectomy, when in fact the appendix was found to be normal.

In addition, it may be useful to identify the reasons for incorrect assessment of possible appendicitis. For example, presence of other conditions such as cecal diverticulitis, inflammatory bowel disease, pelvic inflammatory disease, epiploic appendigitis, etc.

Factors Potentially Influencing Performance
After analyzing the data, identify areas where there is room for improvement. Reflect on your setting and practice and identify factors that may have influenced your results. Potential contributors may include:

1. CT protocol and scanning technique used.
2. Clinical history provided.
3. Perceptual and/or interpretive errors.

Intervention
Team members, should meet to review the cases in which appendicitis was called on the CT scan but the patient was found not to have appendicitis. The review should include a discussion of possible reasons for rendering a false positive interpretation of appendicitis, and a plan for education to address these reasons and improve reader performance.

Post Intervention Data Collection
Using the same data collection strategy as for Baseline Data Collection, collect a similar number of cases and recalculate the true positive rate. Review the Post Intervention Data with your project team and compare to Baseline Data. Discuss the effect of specific strategies employed. Develop plan for ongoing performance monitoring.