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Consultation Timing Matters: Safely Reducing Utilization of Computed Tomography Imaging for Pediatric Appendicitis via Earlier Surgical Consultation



Introduction: Appendicitis is a common pediatric surgical emergency, yet there is significant variability in its diagnostic approach. Given the increased malignancy risk and costs associated with computed tomography (CT) in childhood, safe reduction of CT imaging in the workup of appendicitis is warranted. We aimed to reduce CT utilization in the diagnostic evaluation of pediatric appendicitis from 32% to 15% by implementing earlier surgical consultation.

Methods: Retrospective baseline data were obtained from 01/2021- 08/2021. Post-intervention data were collected prospectively. A multidisciplinary team developed a key driver diagram. A clinical practice guideline utilizing the Pediatric Appendicitis Score (PAS) and recommending surgical consultation prior to ordering CT imaging was published in 12/2021 with a corresponding order set. The primary outcome was CT utilization with balancing measures of negative-pathology appendectomies (NPA) and ED return within 72 hours. Data were analyzed using statistical process control charts and Nelson rules to detect special cause variation.

Results: The baseline period (n=624) demonstrated a CT utilization rate of 31.3%. Surgical consultation rate prior to CT imaging was 69.4%. In the post-intervention period (n=996), special cause variation was detected in CT utilization rate (centerline shift to 11.8%) and rate of surgical consultation prior to CT imaging (centerline shift to 94.6%). There was one ED return visit within 72 hours and no change in NPA rate.

Conclusions: Computed tomography imaging can be safely minimized in the workup of pediatric appendicitis. Earlier involvement of the surgical team and utilization of validated risk scores as key elements of an institutional clinical practice guideline facilitated the observed reduction in computed tomography utilization. Ongoing efforts include standardization of surgical consultation templates and continuous performance review.