

## Diagnostic accuracy of C-reactive protein for appendicitis in primary care

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### Background

The diagnostic value of C-reactive protein (CRP) for appendicitis has been extensively evaluated in specialist care, but not in primary care.

### Aim

To determine the (added) diagnostic value of CRP for appendicitis in children with acute abdominal pain in primary care.

### Methods

A retrospective cohort study of children aged 4-18 years who presented in general practices with acute abdominal pain and a CRP test, between 2010 and 2016. CRP levels at first contact were compared to the final diagnosis of appendicitis reported in the specialist reports within six weeks. Test characteristics of CRP were calculated for multiple thresholds. To evaluate the added value to history and physical exam we compared the area under the receiver operating characteristics curves (AUC) and decision curves of two logistic regression models: 1) basic model (six clinical features assessed by the GP) and 2) basic model plus CRP.

### Results

Of 1076 included patients, 203 (19%) were referred to specialist care and 70 (7%) had appendicitis. The sensitivity and specificity of CRP for a commonly used threshold of 10 mg/L was 0.87 (0.77-0.94) and 0.77 (0.74-0.79) respectively. The sensitivity increased to 1.00 (0.89-1.00) when the symptoms had lasted longer than 48 hours. Adding CRP to the basic model of clinical features increased the AUC significantly from 0.81 (0.76-0.85) to 0.88 (0.84-0.91). The decision curve showed that the basic model plus CRP had the highest net benefit at reasonable threshold probabilities (figure 1).

### Conclusions

In primary care, CRP showed to have an added value to history and physical examination in the diagnostic work-up of appendicitis in children with acute abdominal pain. A value below 10 mg/L in children with symptoms longer than 48 hours could safely rule out appendicitis.

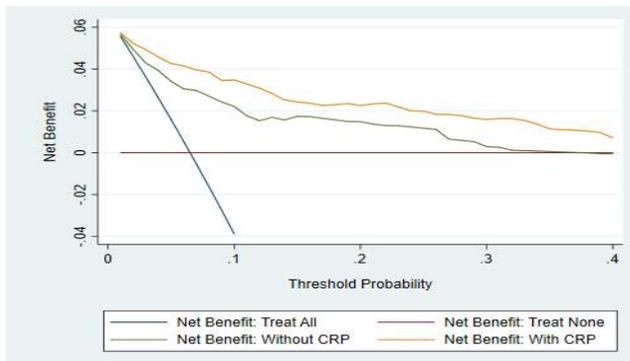


Figure 1. Decision curve for both models predicting appendicitis.

### Keywords

CRP, appendicitis, primary care