Improvement Without Value

We read with interest the quality report by Kurowski et al, titled "Improvement Methodology Increases Guideline Recommended Blood Cultures in Children With Pneumonia." We applaud the authors for their successful implementation and description of a complex project using quality improvement methods. The first question in the model for improvement is: "What are we trying to accomplish?" Perhaps a second question should be added: "Why?" Kurowski et al. cite compliance with the 2011 Pediatric Infectious Diseases Society/Infectious Diseases Society of America guidelines and "to standardize management" to support their aim. In their project, they increased the percent of blood cultures performed in children admitted for community-acquired pneumonia (CAP) from 53% to 79%.

Although the CAP guideline recommends blood cultures in children admitted with moderate to severe CAP, the evidence cited for this recommendation is weak. In fact, as Kurowski et al acknowledge, research published since guideline release further questions the utility of blood cultures. One thing, however, on which all these studies agree is that the percent of pathogenic bacteria recovery is usually <5%, and in most, the actionable information obtained is even lower. Most telling is the authors’ comparison of their study to Heine et al.1 In that article, researchers studied the effectiveness of institutional guidelines in decreasing the frequency of unnecessary blood cultures compared with national CAP guidelines. They studied a similar number of patients, 330; found the same ratio of pathogens to contaminants, 1:1; and an almost identical rate of true bacteremia, 1.5%. All 5 patients with bacteremia had radiographic evidence of effusion or empyema and were admitted to intensive care or described as being septic, thus meeting their institutional criteria to obtain blood culture. Adoption of institutional guidelines could have reduced the frequency of blood cultures from 47% to 26% without missing any true-positives. Interestingly, the authors of the current study had institutional guidelines similar to the ones proposed in Heine et al, and they were working! In fact the authors, through their intervention, managed to decrease their percent of true-positive blood cultures from an unusually high rate of 6.3% pre-intervention to a negligible rate of 1.3% by drawing more blood cultures.

After adjusting for covariates, the authors did not find an increased length of stay in patients with blood cultures versus those without; thus, we assume they conclude lack of harm. However, there are other harms of obtaining unnecessary blood cultures: increased pain and discomfort (the authors do not describe how many extra venipunctures it took to improve compliance), costs, possible exposure to broad-spectrum antibiotics, and increased testing including repeat cultures.

Again we applaud the authors for demonstrating how a multimodal, complex quality improvement project to increase adherence to national guidelines can be successfully implemented and described. We question however, the value of this particular endeavor. The authors have managed to increase costs at the expense of dubious patient benefit. They have exposed some of the weaknesses of the current enthusiasm for quality improvement, and remind us to consider value before embarking on that next plan-do-study-act endeavor.

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Conflict of Interest:
None declared

REFERENCES
doi:10.1542/peds.2015-1549A

Author’s Response

We thank Drs Quinonez and Garber for their thoughtful comments on our recent manuscript and appreciate the opportunity to further clarify our work. We agree that those embarking on improvement projects should consider value. The improvement project described in this article1 is part of a larger institutional portfolio of improvement work centered on patients admitted with acute lower respiratory tract infections (LRTIs). Identification of the etiology of acute LRTIs is challenging. Most cases are viral,2 yet most children diagnosed with pneumonia receive antibiotics. Our efforts to increase the proportion of children with suspected bacterial pneumonia who had blood cultures performed were not conducted in isolation but rather carried out as a part of this larger portfolio of work. Related projects at our institution have included reducing resource utilization, such as by using narrow- rather than broad-spectrum antibiotics, in children with pneumonia,3 minimizing pulse oximetry in children with bronchiolitis,4 and improving discharge processes.5 The overall aim of this portfolio of work is reliable delivery of effective and efficient care to children with acute LRTIs. Part of our effort, which was not highlighted prominently in the publication, included encouragement of emergency department providers not to obtain blood cultures if they suspected a viral etiology of the acute LRTI. While performing chart reviews, we noted improved documentation around suspected viral etiology of acute LRTI, which allowed us to appropriately exclude these patients from the