

Rethinking the 48-Hour Rule-Out: Time to Positivity in Blood Cultures at a Pediatric Hospital

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Abstract

Background: Initiation and continuation of empiric antimicrobial agents for a 48-72 hour rule out until blood cultures are deemed negative are essential in the diagnosis and treatment of infants and children with suspected sepsis and serious bacterial infections (SBI). We aimed to determine the time to positivity (TTP) of blood cultures at a free-standing pediatric hospital over a 6-year period.

Methods: Data were extracted from our data warehouse for all patients who were hospitalized and had blood cultures drawn from January 2013 to December 2018. After exclusion positive blood were chart reviewed for both microbiologic and clinical data. TTP was calculated based on date and time culture was collected compared to date and time growth was first reported.

Results: Over a six-year period, a total of 6,184 positive blood cultures were identified out of 89,663 total cultures. After exclusions, a total of 2,130 positive blood cultures were included in this study. Overall TTP (mean hours, 95% confidence interval) for all included blood cultures was 21.26 hours (20.77;21.77). The mean (95%CI) TPP for gram-positive absolute pathogens and gram-negative absolute pathogens were 16.73 (16.18;17.3), and 15.99 (15.06;16.97), respectively. There was no difference seen in TPP between subspecialties within the hospital or type of line the blood culture was obtained from.

Discussion: This study shows that 36 hours or less may be a sufficient period of observation for infants and children started on empiric antimicrobials for sepsis or SBI. These findings highlight opportunities for antimicrobial stewardship to limit antimicrobial exposure.