

Deja Vu All Over Again: Re-evaluating the Accuracy of the Modified Boston and Philadelphia Criteria for Invasive Bacterial Infection

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Figuring out which infants from 29-60 days of age need a diagnostic workup for sepsis has plagued us for decades. Recently biomarkers like procalcitonin have come on the horizon to help better identify those infants at greatest risk. Before we had such biomarkers, we had rather simple tools, including history, physical, and basic laboratory tests. In the 1980s and 1990s, there was a lot of attention given to two sets of criteria derived by emergency room physicians in Boston and Philadelphia whose criteria for determining who was at high risk for invasive bacterial infection (IBI). The "modified Boston" criteria included a peripheral white blood count (WBC) $>20,000$ cells/mm³, a CSF SBC >10 cells/mm³ and urinalysis with >10 WBC/high power field (HPF) or a positive urine dipstick (reference found in the bibliography). The "modified Philadelphia" criteria used a WBC $>15,000$, CSF WBC >8 cells/mm³ a positive CSF gram stain and a urinalysis with >10 WBC/HPF or a positive urine dip (reference found in the bibliography). How accurate are these criteria when revisited 20+ years since their publication?

Lyons et al ([10.1542/peds.2019-3538](#)), representing the Herpes Simplex Virus Study Group of the Pediatric Emergency Medicine Collaborative Research Committee, re-evaluated the effectiveness of these criteria by applying both criteria to over 8,000 infants in a multi-center cohort of febrile infants. Are these criteria still the go-to criteria we should apply to 2-month-old febrile infants? Not necessarily as you will find by reading this interesting study. Both criteria were modestly sensitive (62.7% for Boston and 71.7% for Philadelphia) and specific (59.2% for Boston, and 46.1% for Philadelphia). When it came to diagnosing IBI, both criteria misclassified a substantial number of infants including missing infants with bacterial meningitis.

So, where should we go from here? The Pediatric Emergency Care Applied Research Network (PECARN) is working to identify new criteria with novel biomarkers to better guide us in which infants need a full sepsis evaluation. This study is a good reminder about the limited predictive ability of these rules and the need to be cautious. [Link to this study and learn more.](#)

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