



What Does It Mean When A Febrile Child Has an Elevated C-Reactive Protein and a Normal White Blood Cell Count?

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Editor's Note: Sam Baldazo is a pediatrics resident at the University of Virginia. He graduated from Dell Medical School at University of Texas, Austin. Sam is interested in value-based care and palliative medicine.

-Rachel Y. Moon, MD, Associate Editor, Digital Media, Pediatrics

It is often difficult to find a definitive diagnosis when evaluating a febrile child. Without a definitive starting point, the initial workup tends to be broad. Primary care, emergency department, and hospitalist pediatricians may be stumped when their initial workup returns negative for a definitive etiology. Among the lab tests almost always included in that initial work up is a complete blood count (CBC) with a differential for white blood cell lineages. However, a study from Dr. Tarek Zuabi and colleagues from the Schneider Children's Medical Center of Israel, which is being early released this week as a Research Brief in *Pediatrics*, prompts a more critical look at this commonly ordered lab test, specifically looking at the utility of obtaining a white blood cell count (WBC) when bacterial infection must be ruled out ([10.1542/peds.2022-057843](#)).

The authors of this study wanted to take a closer look at how to interpret an elevated or normal WBC when an elevated CRP is present. As CRP is an acute phase reactant, the CRP level rises in response to inflammation. When compared with the erythrocyte sedimentation rate (ESR), blood levels of CRP are more quickly responsive to the introduction and removal of the [inflammatory source](#). The authors of this

retrospective study wanted to look more closely at cases of children who had fever and discordance between the CRP and the WBC, specifically those with elevated CRP and normal WBC. They found that, in children 3 months to 18 years, after excluding patients with cancer, immunosuppression, or neutropenia, around 40% of patients with a CRP >15 had a normal white blood cell count. In this discordance group, about 75% of patients had a bacterial infection identified, as compared to 86% of patients for whom both CRP and WBC were elevated. The most commonly identified infections were respiratory, urinary tract and ENT infections, with respiratory and urinary tract infections more likely to have concordance of elevated CRP and WBC. The researchers also found that the discordance group was more likely to have bacterial enteritis, and they note that bacterial enteritis has been reported in other studies to be often associated with a normal WBC.

The main takeaway from this article is that we should think more carefully about how to apply a WBC result when evaluating a child with fever. A normal WBC by itself does not exclude a bacterial infection – and so may not be entirely reassuring, and this Research Brief suggests that there may be value in obtaining a CRP in addition to or instead of a WBC to help work up for a bacterial infection in the pediatric population, especially when there are no gastrointestinal symptoms present. However, in many institutions, a CRP cannot be obtained in a timely enough fashion to help in your work up, and based on this Research Brief, a normal WBC in and of itself may not be sufficient to rule out bacterial infection. I would encourage you to read this article. Of note, the table in the paper does an excellent job of breaking down the different demographics, which may be important to consider when making the decision of which labs may be helpful in your diagnostic workup for a child with fever.