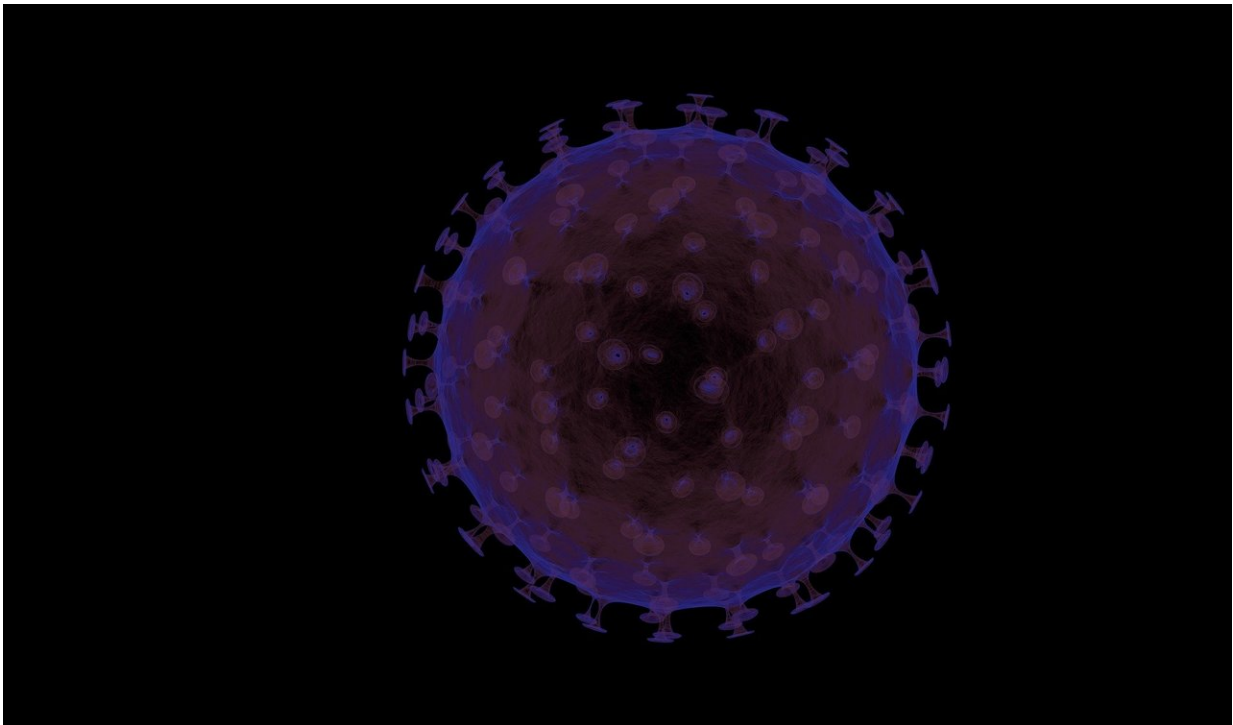


# Researchers find febrile infants may not need painful tests, antibiotics, hospitalizations

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A national research team led by UC Davis Health clinicians and researchers from the University of Michigan, Nationwide Children's Hospital and Columbia University, has derived and validated a new protocol for emergency departments that can determine which infant patients with fevers, age 60 days or younger, are at low risk of

significant bacterial infections.

The finding has important implications for identifying cases in which [infants](#) may not need invasive medical care such as spinal taps, antibiotics or hospitalizations.

The major study, which involved nearly 2000 febrile infants who were evaluated at 26 emergency departments around the country, showed how physicians can more precisely identify babies who are at low risk of serious bacterial infections such as urinary tract infections, bacteria in the blood and bacterial meningitis, in order to avoid spinal taps (also known as lumbar punctures), antibiotic medications and hospitalizations, which also carry risks and can be costly.

The study, "A clinical prediction rule to identify febrile infants 60 days and younger at low risk for serious bacterial infections," is online today [Embargoed until Mon., Feb. 18, 2019 at 11 a.m. ET] in *JAMA Pediatrics*.

The new protocol, which could be implemented following a larger validation study, would enhance decision-making for emergency room providers and bring relief to the parents of many of the nearly half-million febrile infants who are evaluated in U.S. emergency departments each year.

"Missing a serious bacterial infection in an infant can lead to severe complications, which is why physicians traditionally have been very cautious and included invasive procedures, medications and hospitalizations when evaluating these infants," said Nathan Kuppermann, professor and chair of emergency medicine at UC Davis School of Medicine and lead author of the study. "We were able to derive and validate a prediction rule, essentially a mathematical tool for physicians to confidently make clinical decisions about young infants

with fevers to identify those who are at low risk of serious bacterial infections."

Fewer than 10 percent of infants evaluated for fever in emergency departments in the United States typically have serious or potentially life-threatening bacterial infections. However, because of their age and the standard treatment guidelines, many must undergo invasive testing, be hospitalized and given antibiotic treatments until bacterial [infection](#) can ruled out.

Kuppermann and his research colleagues in the Pediatric Emergency Care Applied Research Network (PECARN) - a network of pediatric emergency departments throughout the country that is working to establish new, evidence-based standards for managing common and important problems in pediatric emergency care—have been working to develop better approaches to identifying febrile babies who are at low risk of serious bacterial infections. Two years ago, the same research consortium established a proof of principle for measuring patterns of ribonucleic acid (RNA) expression in the bloodstream that could enable clinicians to distinguish bacterial infections from other causes.

Now, in this large, multi-center observational study, 1,821 infant patients with fevers who were up to two-months (60 days) old were enrolled and randomly divided into two groups. Using sophisticated statistical methods, the research team identified three easily obtainable laboratory tests—the urinalysis, absolute neutrophil count (ANC) in the blood and a serum procalcitonin—to assess and validate the rule physicians could use to exclude serious bacterial infections with very high accuracy.

"Our data contributes important information in the decades old debate about the necessity of lumbar punctures and hospitalizations for young babies with fevers," added Prashant Mahajan, professor and vice-chair of emergency medicine at the University of Michigan Medical School

and C.S. Mott Children's Hospital, and the study's senior author. "This study adds [important information](#) that we think will decrease the variability in current protocols and minimize unnecessary tests and hospital admissions, which can carry other risks for young patients."

While encouraged by their findings, the researchers noted that further validation is important before the new rule should be fully implemented, especially among cohorts with greater numbers of invasive bacterial infections.

"Clinicians must remain particularly wary in cases where infants are younger than 28 days," noted Octavio Ramilo, division chief of Infectious Diseases at Nationwide Children's Hospital, and a principal investigator on the study with Kuppermann and Mahajan. "That is the age group in whom the risks of bacteremia and bacterial meningitis, as well as herpes encephalitis, are the greatest."

In addition to Kuppermann, Mahajan and Ramilo, researchers included Peter Dayan from Columbia University and nearly two dozen other co-authors in the pediatric research network.

Provided by UC Davis

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