

P: In patients 3-36 months with documented fever who are well appearing with UTD immunizations

I: Do we need to draw labs (CBC, BCx, UA, UCx)

C: Compared to urine only/observation

O: Decrease painful procedures without changing risks

Background: Prior to 1990, 3-12% of children under 3 years of age with FWLS had occult bacteremia. Occult bacteremia can lead to SBI including sepsis, meningitis, pneumonia, osteomyelitis and septic arthritis. In 1993, Larry Baraff et al published a practice guidelines from a consensus panel that recommended CBC and blood culture be obtained on all febrile ($\geq 39^{\circ}\text{C}$) infants age 3-36 months with no source. They also recommended treatment with antibiotics in children whose WBC is 15,000 or more. In 1993 the Haemophilus influenzae type B (Hib) immunization was instituted. After Hib, most cases of occult bacteremia were caused by Strep pneumoniae. In 2000, the Prevar (pneumococcal conjugate vaccine) immunization was instituted.

Article	Patients	Study Type	Outcomes	Positives	Negatives
<p>Author: Lee et al Title: "Management of Febrile Children in the Age of the Conjugate Pneumococcal Vaccine: A Cost-Effectiveness Analysis." Pediatrics, 2001.</p>	<p>Hypothetical Cohort of 100,000 children 3-36 months with fever $\geq 39^{\circ}\text{C}$ and no source of infection.</p>	<p>Decision Analytic Model Six Strategies: 1. No Workup 2. Clinical Judgment 3. Blood Culture 4. Blood Culture + treatment 5. CBC, selective blood culture and treatment 6. CBC, Blood Culture and Selective Treatment</p>	<p>CBC, selective blood culture and treatment using WBC cutoff of 15,000 is cost effective at the current rate of pneumococcal bacteremia (1.5%).</p> <p>If bacteremia rate falls below 0.5% clinicians should reevaluate their approach to the highly febrile child and empiric testing and treatment should be eliminated.</p>	<p>Looked at different rates of bacteremia.</p> <p>Considers cases of antibiotic associated rash, diarrhea and anaphylaxis.</p> <p>Included societal perspective (time loss from work/school)</p>	<p>Focus on prevention of meningitis and life years saved not all possible complications and disability.</p> <p>Based on cost using the 1999 US dollar.</p> <p>Based on a lot of estimates</p>
<p>Author: Herz et al. Title: "Changing Epidemiology of Outpatient Bacteremia in 3-36 month-old children after the introduction of the Heptavalent-Conjugated Pneumococcal</p>	<p>Previously healthy 3-36 month old children who had blood cultures obtained. 41,948 blood cultures were obtained.</p>	<p>Retrospective Case Series between 1998-2003.</p>	<p>84% reduction of Streptococcus pneumoniae bacteremia (Annual number of 106 in the first year to 15 in the fifth year) and 67% reduction</p>	<p>Post PCV7 only 78 positive culture, 35 had known focus, 19 were ill appearing. Only 26 had occult bacteremia,</p>	<p>Retrospective.</p> <p>Did not exclude patients with recognized foci of infection.</p> <p>Unknown immunization status of patients.</p>

<p>Vaccine." Pediatric Infectious Disease Journal, 2006.</p>	<p>37,133 from outpatient setting.</p> <p>1106 were positive (2.97%), 656 were contaminants, 352 significant positive cultures.</p>		<p>in overall bacteremia (Annual number of 136 in first year of study to 45 in the fifth year).</p> <p>Contamination rate remained the same at 1.8% (656/37133).</p> <p>WBC >15000 was poor predictor of bacteremia with sensitivity of 74%, specificity of 54.5% for any significant bacteremia.</p>	<p>prevalence of 0.25%.</p> <p>UTI evaluation could have ID all patients with E.Coli and K.pneumoniae bacteremia.</p> <p>Bacteremia due to S.pneumoniae and E.coli is associated with peripheral leukocytosis; however other organisms becoming more common (Salmonella and Staph aureus) can not be screened for with elevated WBC</p>	<p>Unable to determine immunocompromised hosts in all of the 37,133 blood cultures</p> <p>Low rates of bacteremia by individual organisms limits generalization of patient presentations.</p>
<p>Author: Carstairs et al Title: "Pneumococcal bacteremia in Febrile Infants presenting to the Emergency Department before and after the introduction of the heptavalent pneumococcal vaccine." Annals of Emergency Medicine, 2007.</p>	<p>Febrile (>38) infants under 36 months. 3571 patients, 1,428 with blood cultures, 833 patients received at least one prevnar, 550 unimmunized and 45 unknown immunization status.</p>	<p>Prospective observational cohort study. Medical record review Nov 2000-Oct 2002.</p>	<p>0 of 833 positive blood cultures for pneumococcus compared to 13 of 550 in unimmunized group.</p> <p>4.2% with positive blood cultures (58/1383) 43 were contaminants (74%).</p> <p>In immunized children 17 positive cultures, 15 were contaminants, 2 positives were diagnosed with</p>	<p>In immunized children the 2 who had bacteremia were diagnosed with UTI. Could have been picked up with urine alone.</p>	<p>No follow up to determine if febrile infants with no blood culture drawn.</p> <p>Unknown course of antibiotics prior to presentation in ER.</p> <p>Age range 0 days to 36 months.</p> <p>Unknown level of illness in patients.</p>

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<p>Author: Wilkinson et al Title: "Prevalence of Occult bacteremia in children aged 3 to 36 months presenting to the Emergency Department with fever in the Postpneumococcal Conjugate Vaccine era." Academic Emergency Medicine, 2008.</p>	<p>3-36 months, febrile, previously healthy, no source of infection on examination, had blood culture drawn and were discharged from the ED.</p>	<p>Retrospective cohort study. July 2004-June 2007</p>	<p>8,413 febrile 3-36 month olds who had blood culture drawn. 185 grew organism, 159 were contaminants, 26 were true pathogens.</p> <p>5 positives excluded because of diagnosis.</p> <p>Contamination rate of 1.89% and true pathogen rate of 0.25%</p>	<p>Prevalence of Occult bacteremia in the range of 0.16% to 0.37%.</p>	<p>Retrospective.</p> <p>Unknown number of children who presented to ED with fever who did not get a culture – possible overestimation of occult bacteremia prevalence.</p> <p>Unknown Immunization status</p> <p>Unable to exclude premature infants, recent hospitalizations or recent antibiotic use.</p>
<p>Author: Waddle et al Title: "Outcomes of febrile children without localizing signs after pneumococcal conjugate vaccine." Archives of Disease in Childhood, 2009.</p>	<p>Children age 3-36 months who presented with FWLS. Temp $\geq 39^{\circ}\text{C}$. Pre PCV7 1184 patients age 3-36 months with blood cultures with complete records. Post PCV7 1994 patients.</p>	<p>Retrospective Chart Review using clinical microbiology laboratory database. Pre PCV7 (1997-1999) and Post PCV7 (2001-mid 2004)</p>	<p>Pre PCV7 148 patients fit criteria for FWLS Post PCV7 275 patients</p> <p>Pre PCV7: 17 positive blood cultures, 10 pathogens, 7 contaminants</p> <p>Post PCV7: 14 positive blood cultures, 13 were contaminants.</p> <p>Occult bacteremia 6.8% (10/148) of FWLS before PCV7 and 0.4% (1/275) after.</p> <p>92.9% (13/14) Contaminant rate after PCV7</p>	<p>Occult Bacteremia post prevnar is 0.4%</p> <p>Agreed with NICE green guidelines for managing febrile infants by pediatric specialist (check urine, no Blood Culture, no Antibiotics)</p>	<p>Retrospective.</p> <p>Small number of patients.</p> <p>Unknown immunization status of patients.</p> <p>Unknown number of febrile children who did not have blood cultures obtained.</p>
<p>Author: Richardson et al.</p>	<p>Children with fever, defined</p>	<p>National Guideline in</p>	<p>1. Vital Signs including</p>	<p>Duration of fever not</p>	<p>Not based on rectal temps</p>

<p>Title: “Feverish illness in children, Assesment and initial management in children younger than 5 years.” May 2007.</p>	<p>as 38°C if 3 months or less, 39°C if aged 3-6 months</p>	<p>the UK</p>	<p>temperature, heart rate, respiratory rate and capillary refill. BP only if heart rate or capillary refill is abnormal.</p> <p>2. Assessment based on traffic light system (all green, one or more for amber or red)</p> <p>3. 3months or older with fever</p> <p>Non Peds:</p> <p><u>Red:</u> Refer to Peds specialist</p> <p><u>Amber:</u> Refer to Peds specialist or give family a “safety net” (verbal +/- written info with further follow up)</p> <p><u>Green:</u> Can be managed at home, check urine if symptoms, check CXR if symptoms</p> <p>Peds:</p> <p><u>Red:</u> CBC, BCX, CRP, Urine, consider LP, CXR, lytes and gas</p> <p><u>Amber:</u> Urine, CBC, CRP and BCx, consider LP in <1 year</p>	<p>important, except if 5 days or more</p> <p>Urine should be considered in any child younger than 3 months with fever. Only if having symptoms in children over 3 months.</p>	<p>Different guidelines based on heath care professional experience</p>
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			and CXR if fever > 39 and WBC >20K <u>Green:</u> Urine and assess for signs and symptoms of pneumonia. No Bloodwork		

Conclusion: In children ages 3-36 months who present with fever with no source after detailed history and physical exam, as long as they have received one prevnar and one Hib, check urine only. Some evidence to support no blood work in unimmunized children, possibly due to herd immunity, but more focused research should be done on this topic.