



EM CASES SUMMARY

Episode 173 Febrile Infant Risk Stratification & Workup

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There has been a major paradigm shift in how we work up the febrile infant in the ED recently. Validated decision tools that include procalcitonin have allowed us to safely avoid lumbar puncture, immediate empiric IV antibiotics, and admissions to hospital in a greater proportion of febrile infants than in the past. Gone are the days that every febrile infant less than 60 days of age reflexively get an LP, full septic workup, empiric antibiotics and pediatric consult/admission. We need to slow down and consider the decision tools and an algorithm based on the latest evidence and the upcoming Canadian Pediatric Society position statement on febrile infants that we present here.

Important definitions for the febrile infant

Fever: single temperature >38.0 °C rectal

Fever without a source in pediatrics: child <3 years old, who after initial history and physical, do not have an identifiable cause of their fever

SBI: Serious Bacterial Infection – includes urinary tract infection, bacterial meningitis and bacteremia

IBI: Invasive Bacterial Infection – includes only bacterial meningitis and bacteremia

ANC: Absolute Neutrophil Count

Febrile infant low risk decision tools for infants: PECARN, Step-by-Step and Aronson

The choice of which decision tool one uses depends on local availability of procalcitonin.

Step-by-Step Febrile Infant Decision Tool

1. Well appearing
2. 22-90 days old
3. Urinalysis negative for leukocytes
4. Procalcitonin <0.5 ng/mL
5. CRP ≤ 20 mg/L and ANC $\leq 10,000/\mu\text{L}$

All criteria met = low risk = 0.7% risk of IBI – full septic workup likely not required; consider observation in ED and ensure close outpatient follow up

PECARN Febrile Infant Decision Tool

1. Urinalysis negative for leukocyte esterase, nitrites and pyuria (WBC ≤ 5 /hpf)
2. ANC $\leq 4090/\mu\text{L}$
3. Procalcitonin ≤ 1.7 ng/mL

The PECARN rule low risk febrile infants 26-60 days of age has a 99.8% sensitivity for SBI.

Aronson Febrile Infant Decision Tool (when procalcitonin is not available)

1. Age <21 days (1 point)
2. Highest temperature measured in the ED
 - 38.0-38.4 °C (2 points)
 - ≥38.5 °C (4 points)
3. ANC ≥5185/μL
4. Urinalysis positive (leucocyte esterase, nitrites or pyuria (>5WBC/hpf 3 points))

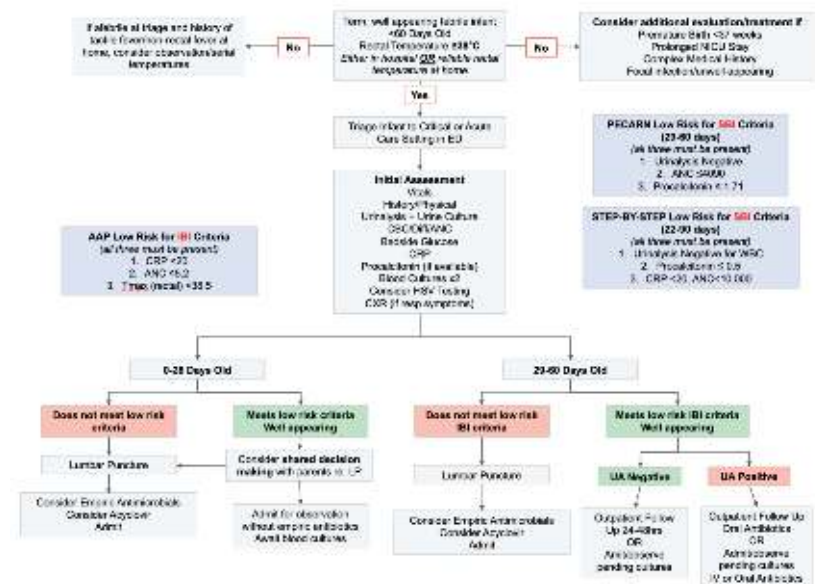
“A score <2 can be used to identify infants with a history of fever only, who have a low probability of having an IBI, and who may not require CSF testing.”

Top 5 pitfalls to avoid in the febrile infant

1. **Height of fever** – although data suggests infants who have a higher fever have a higher probability of IBI, many infants with IBI do not have high fevers, so when it comes to deciding whether to work them up, fever should be treated as a binary “yes or no”.
2. **Afebrile at triage** – do not disregard the infant with a single rectal temperature above 38 °C taken by a reliable caregiver that is no longer febrile when they present to the ED – these infants have the *same* risk of IBI as infants that remain febrile when we see them in the ED (remember fevers are often cyclic).
3. **Febrile infants with URI** – Do not disregard the febrile infant presenting with signs and symptoms of a viral illness such as a upper respiratory tract infection as these infants may still have a concomitant bacterial infection and require the same initial management approach.

4. **Normal serum WBC** – do not be fooled by a normal WBC; in this age group the sensitivity of WBC for SBI is only 55%.
5. **Rise of CRP and ANC vs Procalcitonin** – CRP and ANC take longer to rise than procalcitonin and may not be elevated yet in a fever <24hours. Do not assume absence of IBI in a febrile infant with normal CRP and ANC when fever has been present for <24hrs.

EM Cases Febrile Infant Risk Stratification and Work-up Algorithm



Febrile Infant Algorithm EM Cases

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