

# *Do Low-Risk Febrile Infants Aged $\leq 60$ Days Need a Lumbar Puncture?*

**Risk Stratification of Febrile Infants  $\leq 60$  Days  
Old Without Routine Lumbar Puncture**  
*Pediatrics - Nov 2018*

## REFERENCES :

1. *D Lehman and DJ Pallin. Do Low-Risk Febrile Infants Aged  $\leq 60$  Days Need a Lumbar Puncture? in*

<https://www.jwatch.org/na47933/2018/11/19/do-low-risk-febrile-infants-aged-60-days-need-lumbar>

2. Aronson PL et al. Risk stratification of febrile infants  $\leq 60$  days old without routine lumbar puncture. *Pediatrics* 2018 Nov 13

# 1.OBJECTIVES:

To evaluate the Rochester and modified Philadelphia criteria for the risk stratification of febrile infants with invasive bacterial infection (IBI) who **do not *appear ill*** without routine cerebrospinal fluid (CSF) testing.

**TABLE 1** Low-Risk Components for the Rochester and Modified Philadelphia Criteria

Components	Rochester	Philadelphia
Demographics	N/A <sup>a</sup>	Age >28 d
Past medical history	Previously healthy <sup>b</sup>	Previously healthy <sup>b</sup>
Physical examination	No skin or soft tissue infection, <b>bone, ear infection</b>	No skin or soft tissue infection, <b>bone, ear infection</b>
Laboratory	Normal urinalysis <sup>c</sup> ; peripheral WBC count of $\geq 5000$ and $\leq 15\,000$ ; absolute band count of $\leq 1500$ bands per $\mu\text{L}$	Normal urinalysis <sup>c</sup> ; peripheral WBC count of $\geq 5000$ and $\leq 15\,000$ ; I/T ratio of $< 0.2$ <sup>d</sup>

N/A, not applicable.

- CSF:  $< 8$  WBC/ $\mu\text{L}$ ; no bacteria on Gram stain
- Chest radiograph is no infiltrate

<sup>a</sup> Rochester criteria include infants  $\leq 60$  d of age without an age cutoff to define low risk.

<sup>b</sup> Gestational age  $\geq 37$  wk; no previous ED visit, hospitalization, or evaluation for fever; no previous IBI or treatment with antibiotics; no other significant past medical history.

<sup>c</sup> Urine dipstick with no or trace leukocyte esterase, negative nitrites, and urine microscopy, with  $\leq 5$  WBCs per HPF or  $\leq 5$  WBCs per  $\text{mm}^3$  on an enhanced urinalysis.

<sup>d</sup> Bands-to-total neutrophil ratio.

# General Impression

(First view of patient)

**Airway & Appearance**  
(Open/Clear – Muscle Tone /Body Position)

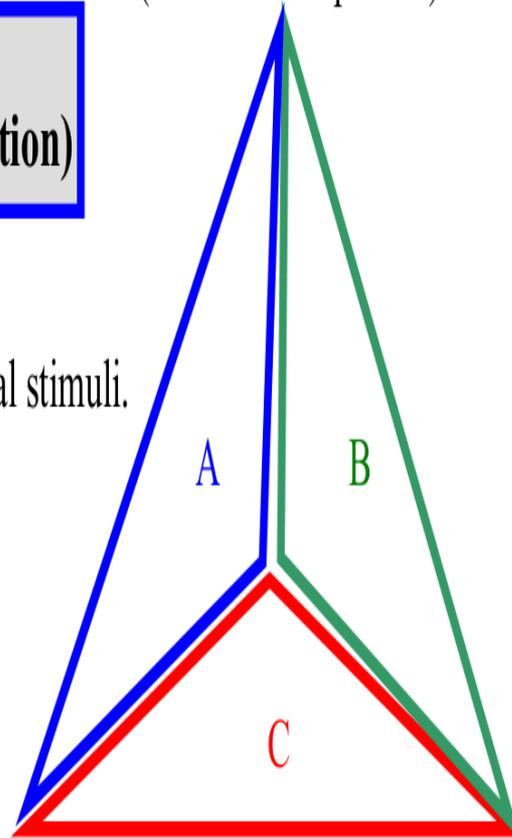
**Abnormal:** Abnormal or absent cry or speech.  
Decreased response to parents or environmental stimuli.  
Floppy or rigid muscle tone or not moving.

**Normal:** Normal cry or speech. Responds to parents or to environmental stimuli such as lights, keys, or toys. Good muscle tone. Moves extremities well.

**Work of Breathing**  
(Visible movement / Respiratory Effort)

**Abnormal:** Increased/excessive (nasal flaring, retractions or abdominal muscle use) or decreased/absent respiratory effort or noisy breathing.

**Normal:** Breathing appears regular without excessive respiratory muscle effort or audible respiratory sounds.



**Circulation to Skin**  
(Color / Obvious Bleeding)

**Abnormal:** Cyanosis, mottling, paleness/pallor or obvious significant bleeding.

**Normal:** Color appears normal for racial group of child. No significant bleeding.

~10% of febrile infants  $\leq 60$  days of age evaluated in the emergency department have a serious bacterial infection.

-The Rochester and Philadelphia criteria are widely used  $>30$  and  $20$  years ago to stratify risk of IBI in febrile infants, with sensitivity of  $>90\%$ .

-Given the rarity of bacterial meningitis ( $0.2\%$ ) in febrile infants  $>28 - 60$  days of age who appear well and the unclear benefit of routine of CSF testing: performing CSF varies substantially across hospitals.

## 2. Methods:

A **case-control** study of febrile infants  $\leq 60$  days old presenting to 1 of 9 emergency departments (2011-2016). For each infant with IBI (a blood and/or CSF culture +), controls without IBI were matched by site and date of visit.

Exclusion:-Infants appeared ill

- Infants had a complex chronic condition

- Missing data for any component of the

Rochester or modified Philadelphia criteria.

### 3.RESULTS - DISCUSSIONS:

135 infants with IBI: bacteremia without meningitis (118 =87%) and bacterial meningitis with/without bacteremia (17 =13%) and 249 controls were included.

The sensitivity of the modified Philadelphia criteria was higher than that of the Rochester criteria (92% vs 82%;  $P = .01$ ), but the specificity was lower (35% vs 60%;  $P < .001$ ).

Among 67 infants >28 days old with IBI (7 with bacterial meningitis), the sensitivity of both criteria was 84%. **None of the 11 low-risk infants had bacterial meningitis (*but with bacteremia*).**

Of 68 infants  $\leq 28$  days old with IBI, 14 (21%) were low risk (the Rochester criteria), and 2 had meningitis.

The modified Philadelphia criteria had high sensitivity for IBI without routine CSF testing, and all infants >28 days old with bacterial meningitis were classified as high risk.

## 4. CONCLUSIONS:

It is safe to forgo lumbar puncture in infants aged  $\geq 28$  days at low risk for invasive bacterial infection.

Consensus is emerging that while *febrile neonates require lumbar puncture and inpatient care*, most older babies with low risk can be managed at home and without lumbar puncture.

Because some infants with bacteremia were classified as low risk, infants discharged from the emergency department without CSF testing require close follow-up.