**Essential Learning**

# Febrile Infant

- **What is the clinical approach to a febrile infant?**
  - Fever (defined as >38°C or 100.4°F) is best measured by rectal temperature.
  - Although most fevers in infants are caused by viruses, serious bacterial infection should always be considered. Specific risk and workup is typically determined by age.
  - The assumption should be made that the child is sick, unless careful evaluation and workup reveals a low risk, well-appearing patient, without apnea or cyanosis and with normal labs.
  - Any **newborn < 4wks** with a fever or who is ill-appearing should be worked up for possible sepsis, including
    - CBC, UA/UCx, 2x blood cultures
    - CXR
    - Lumbar puncture (when stabilized) and CSF studies
      - Infants should be on a monitor for their LP in case they go apneic during the procedure
    - Fluid resuscitation
    - Early and empiric antibiotics including Cefotaxime 100-200 mg/kg div q6-8h (alt ceftazidime) and Ampicillin 300 mg/kg IV div q6h +/- Acyclovir 20 mg/kg q8h if HSV risk
      - Ampicillin covers Listeria, risk significantly lowers after 28 days
      - HSV risk is low after 21 days unless the caregiver has cold sores
      - Ceftriaxone should be avoided until > 6 weeks due to the concern for biliary sludging and kernicterus
    - Admit for observation
  - While a distinct standard of care exists for the infant 28 days or younger with fever (noted above), **after 28 days** management becomes more variable. This is where hospital specific guidelines are helpful. Most hospital guidelines for children between 1-3 months involve some combination of judging patient appearance, checking blood and urine studies, performing a CXR if respiratory symptoms are present and either empirically doing an LP and giving antibiotics, or giving an LP and antibiotics only if labs are abnormal.
  - **After 8wks** there is significant variation in practice and multiple clinical decision making rules (Philadelphia, Rochester, Boston criteria). Generally these rules take into account multiple variables including WBC < 15, Bands < 1.5, CSF wnl (if sent), UA WBC < 10. If pt is low risk per workup they may be sent home without antibiotics and with close outpatient followup; if they are higher risk they should receive the full septic workup and be admitted.

- **Should an LP be done if the UA is positive?**
    - A study of 236 neonates with a urinary tract infection found that no babies had definite meningitis (although two with a bloody tap had probable meningitis).
    - A study of nearly 1700 infants <60 days with UTI found rates of concomitant meningitis of **0.9%** in neonates and **0.2%** in infants 29–60 days old. This is similar to the baseline risk of meningitis in this population (**~0.5%**).
    - Keep infants on the monitor during an LP due to risk of apnea.
    - Ultimately, this decision is based on clinical gestalt and local practices.

- **What is the PECARN 2019 criteria for infants </= 60 days at low risk for serious bacterial infection? *(JAMA Pediatrics 2019)***
    - Population: 1821 well-appearing infants, </= 60d
        - Overall serious bacterial infection (SBI) rate 9.3% (7.7% UTI, 1.4% bacteremia, 0.5% meningitis)
        - 3 low-risk variables were identified
            - UA - Normal (Neg nitrite, Neg LE, < 5 WBC/HPF)
            - ANC </= 4,000/uL
            - Procal </= 0.5 ng/mL
            - All 3 must be met to be low-risk
        - This yielded a sensitivity of 97.7%, specificity of 60%, negative predictive value of 99.6%, and negative likelihood ratio of 0.04
        - The use of this decision tool in neonates is NOT recommended, but can be used in the 29-60 day group.
        - **Further external validation studies are pending**
    - Providers can potentially discharge low-risk patients home with or without antibiotics if they have reliable caretakers, close PCP follow up, ability to return to the ED, comfortability of providers or parents, etc.

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