Foundations Frameworks

Approach to the Febrile Neonate (< 90 days)

Author: Quentin Reuter, MD
Editors: Maneesha Agarwal, MD; Kristen Grabow Moore MD MEd

*** Fever: temperature > 100.4°F or 38°C. Any measured fever must be assumed to be valid ***

1. **Ill Appearing**
    a. THE MISFITS mnemonic:
        i. Trauma: birth trauma, non-accidental
        ii. Heart: congenital heart disease, hypovolemia, hypothermia
        iii. Endocrine: congenital adrenal hyperplasia, thyroid, hypoglycemia
        iv. Metabolic: electrolyte abnormalities
        v. Inborn errors of metabolism: check glucose, urine, ammonia, lactate
        vi. Seizure: check glucose, sodium, and iCal in young babies, as hypocalcemia is a common cause of neonatal seizures
        vii. Formula disasters: hypo/hypernatremia
        viii. Intestinal catastrophe: NEC, volvulus, intussusception
        ix. Toxins: take thorough history
        x. Sepsis
    b. Infection: Full septic workup and treatment
        i. IV/IO access: 20 mL/kg crystalloid bolus
        ii. Evaluation: emergent fingerstick glucose, CBC, chem, blood cultures, UA, urine culture, LP studies, CXR, stool studies (if diarrhea), LFTs if concern for HSV (consider PCR testing as well)
    c. Antibiotics:
        i. ≤ 28 days old
            1. Vancomycin
            2. Ampicillin (needed to cover listeria)
            3. Cefotaxime or Gentamycin
            4. Acyclovir
        ii. > 28 days old
            1. Vancomycin
            2. Ampicillin (listeria risk highest 29-60 days)
            3. Ceftriaxone
            4. Acyclovir (herpes risk highest 29-60 days)
2. **Not Ill Appearing**
    a. Less than 28 days, well-appearing
        i. full septic work-up and antibiotic treatment as noted above
        ii. most experts still recommend CSF studies in patients with confirmed UTI/suspected URI -> consider consultation with pediatric specialist
    b. Older than 28 days, well appearing
        i. This is the most difficult decision in the febrile neonate algorithm
        ii. Use Rochester, Philadelphia, or Boston criteria to determine if child if low risk
        iii. These scores are not perfectly sensitive
        iv. Premature Infants: manage according to their adjusted chronologic age

v. Search for focal bacterial source with basic evaluation:
    1. Abnormal lung sounds -> XR chest to look for PNA
    2. Acute Otitis Media (must be VERY clearly defined and not a "hedge")
    3. UA and culture for urinary tract infection (up to 5% of infants may have negative UA in setting of true culture positive UTI)
    4. Skin exam -> obvious cellulitis
vi. Consider risk factors: pursue further evaluation if concerned
    1. Low risk features:
        a. Term, healthy, well appearing
        b. Normal basic w/u (exam, urine, CBC)
        c. Normal ANC (<10K)/WBC
        d. Normal procalcitonin (<0.05)
        e. Normal CRP (<20mg/dL) – *units may vary*
    2. Disposition:
        a. If 'low risk', consider avoiding LP, +/- antibiotics, admission for observation
        b. If there is a clear source (AOM, PNA, UTI, etc.) you do not necessarily need to do an LP in older infants
        c. Could also consider strict next day follow-up in consultation with pediatric specialist
vii. 'High risk' features present: consider full workup with antibiotics and admission

Common Pitfalls:

- Learn your institutions' guidelines/culture and follow them. Each hospital is a little different in practice. Sticking to guidelines will help if there's a "worst case" scenario liability action
- + RSV swabs are nice, but do NOT get you out of a UA/Cx. 5-10% of bronchiolitis patients will have a concomitant UTI

References:

- Smitherman, HF. Macias, CG. Febrile infant (younger than 90 days of age): Management. Jun 21, 2017. Uptodate.com