

ANMC Clinical Guideline: Fever in Infants 0-90 days old

The following is intended as a clinical guideline and may need to be adapted to meet the special needs of a specific patient, as determined by the medical practitioner.

Infants between 0-3 months of age are particularly vulnerable to serious bacterial infections (i.e. meningitis, sepsis, and UTI) and may present with vague or non-specific symptoms, making it difficult to differentiate between viral and bacterial etiologies. Thus, appropriate evaluation and treatment for fever in this age group has been the topic of much investigation and debate in the pediatric community. The following guideline is a recommended approach to the evaluation and initial treatment for infants 0-90 days old presenting with fever at a facility in the Alaska Native Tribal Health Consortium. Additional considerations include:

- Leading studies and guidelines vary with respect to the upper age limit for standardized work-up, with some limited to 0-60 days of age, and others extending up to 90 days. We have chosen to include all febrile infants up to 90 days of age at this time due to high rates of serious bacterial infections in the Alaska Native population, but with a tiered approach based on age.
- Infants presenting with a focal source of infection (i.e. acute otitis media, pneumonia, omphalitis, cellulitis, osteomyelitis) may require targeted antibiotic therapy instead of, or in addition to, the standard antibiotics outlined in these guidelines.
- We do not recommend routine use of respiratory viral PCR panels, as bacterial infections may be overlooked if a fever is entirely ascribed to the presence of a virus, which may or may not be clinically significant.
- ANMC pediatric hospitalists are available 24/7 to answer questions regarding management of febrile infants.

References

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Initial approval:

11/2017 – EWH

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12/2021 – EWH

12/2023 – KKP

ANMC Fever in Neonates 0-28 Days Guideline

Infant 0-28 days old with temperature $\geq 100.4\text{F}$ (38C)
 (any temperature taken from any source, including home thermometer)

OR

temperature $< 96.8\text{F}$ (36C)
 that does not quickly resolve with environmental measures

- Full septic work-up:**
- CBC w/ diff
 - Blood Culture
 - Procalcitonin (preferred if quick turnaround available) vs. CRP
 - Urinalysis + Urine Culture (cath specimen)
 - Perform Lumbar Puncture for CSF studies:
 - cell counts
 - glucose
 - protein
 - gram stain + culture
 - meningitis/encephalitis multiplex PCR
 - CMP
 - RSV, Flu nasal swab as appropriate
 - Consider CXR if respiratory symptoms
 - HSV work-up if appropriate (see right)
 - Consider stool culture if diarrhea

- Consider HSV work-up and empiric acyclovir in infants with:**
- Severe illness
 - Hypothermia
 - Lethargy
 - Seizures
 - Hepatosplenomegaly
 - Known post-natal HSV contact
 - Vesicular rash
 - Conjunctivitis
 - Interstitial pneumonitis
 - Hepatitis
 - Thrombocytopenia
 - CSF WBC >20 with negative gram stain
 - Concern for maternal primary HSV infection during pregnancy

- LP Considerations**
- Meningitis/encephalitis multiplex PCR requires 1mL of CSF; sample can be goldstreaked to ANMC lab or sent with patient if transferring to ANMC – should be refrigerated but NOT frozen
 - Normal CSF WBC: < 20 (0-28 days)
 - Absence of neutrophils (polys) makes bacterial meningitis unlikely; CSF neutrophils (polys) $>75\%$ increases likelihood of bacterial meningitis
 - If unable to obtain LP: re-attempt in 12-24h, treat with meningitic dosing of antibiotics in the meantime
 - If LP difficult to interpret/bloody: Do not use correction formulas for WBC on traumatic LPs; perform meningitis/encephalitis multiplex PCR on sample and treat with meningitic dosing of antibiotics in the meantime

After blood, urine, and CSF studies obtained, administer first dose of antibiotics STAT while awaiting CSF results (goal within 60min of presentation):

Ampicillin
 age ≤ 7 days: 100 mg/kg/dose IV q8h
 age > 7 days: 75 mg/kg/dose IV q6h

+ Cefepime
 50 mg/kg/dose IV q12h

- HSV Work-Up**
- Blood HSV PCR
 - CSF HSV PCR (included in Meningitis/Encephalitis Multiplex PCR)
 - HSV PCR from surface swabs of bilateral conjunctivae, nasopharynx, and mouth (can be collected on single swab)
 - HSV viral culture from rectal swab
 - HSV PCR from fluid of vesicles, if present (unroof vesicle and then swab base)
 - CMP (for BUN, Cr, AST, ALT)

CSF concerning for meningitis CSF reassuring against meningitis

Admit and continue treatment with:

Ampicillin
 age ≤ 7 days: 100 mg/kg/dose IV q8h
 age > 7 days: 75 mg/kg/dose IV q6h

+ Cefepime
 50 mg/kg/dose IV q12h

+/- Acyclovir (if risk factors for HSV)
 20 mg/kg/dose IV q8h

Admit and switch antibiotics to:

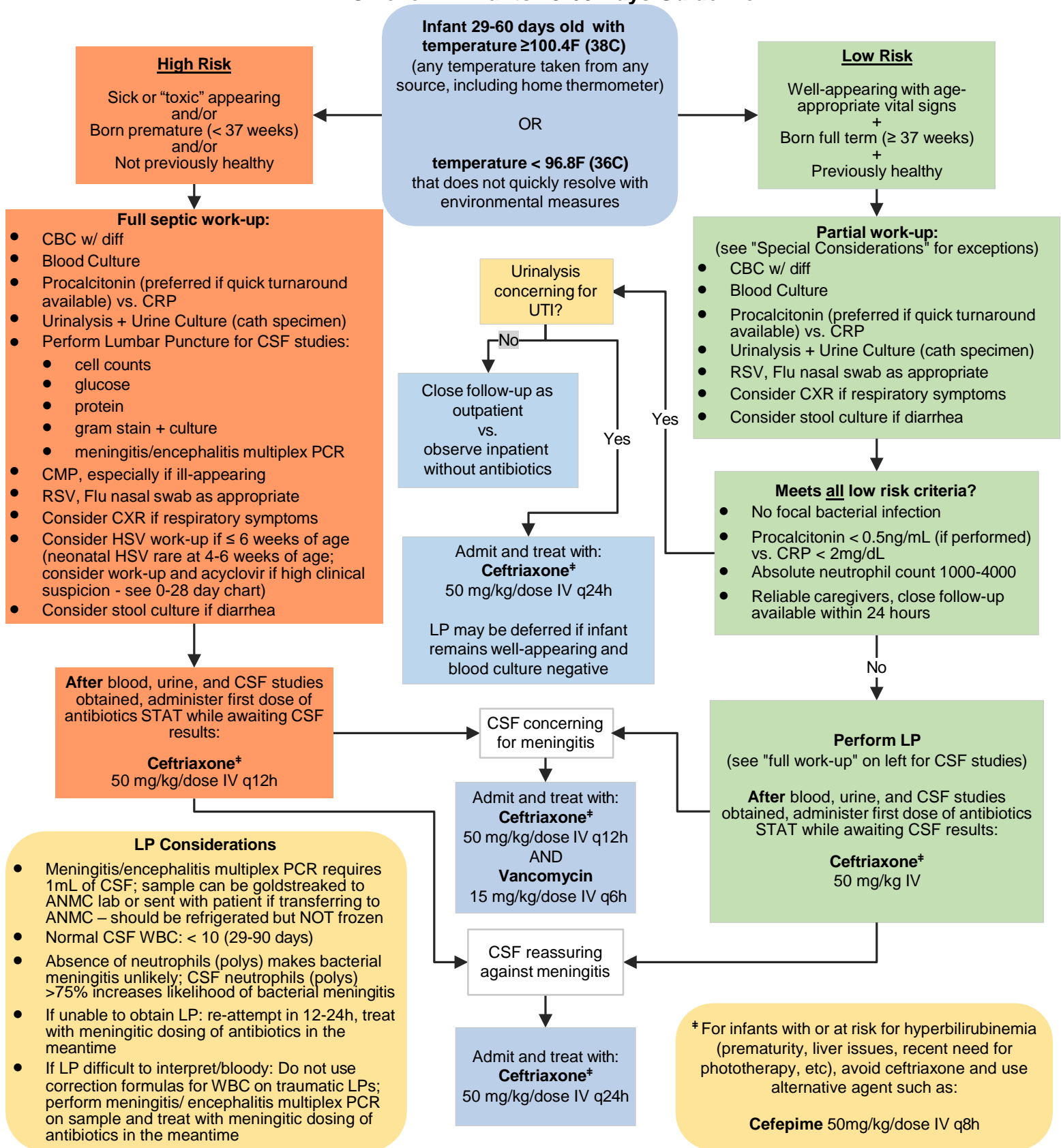
Ampicillin
 50 mg/kg/dose IV q8h

+ Gentamicin*
 age ≤ 7 days: 4mg/kg/dose IV q24h
 age > 7 days: 5mg/kg/dose IV q24h

+/- Acyclovir (if risk factors for HSV)
 20 mg/kg/dose IV q8h

*consider pharmacy consult for gentamicin management

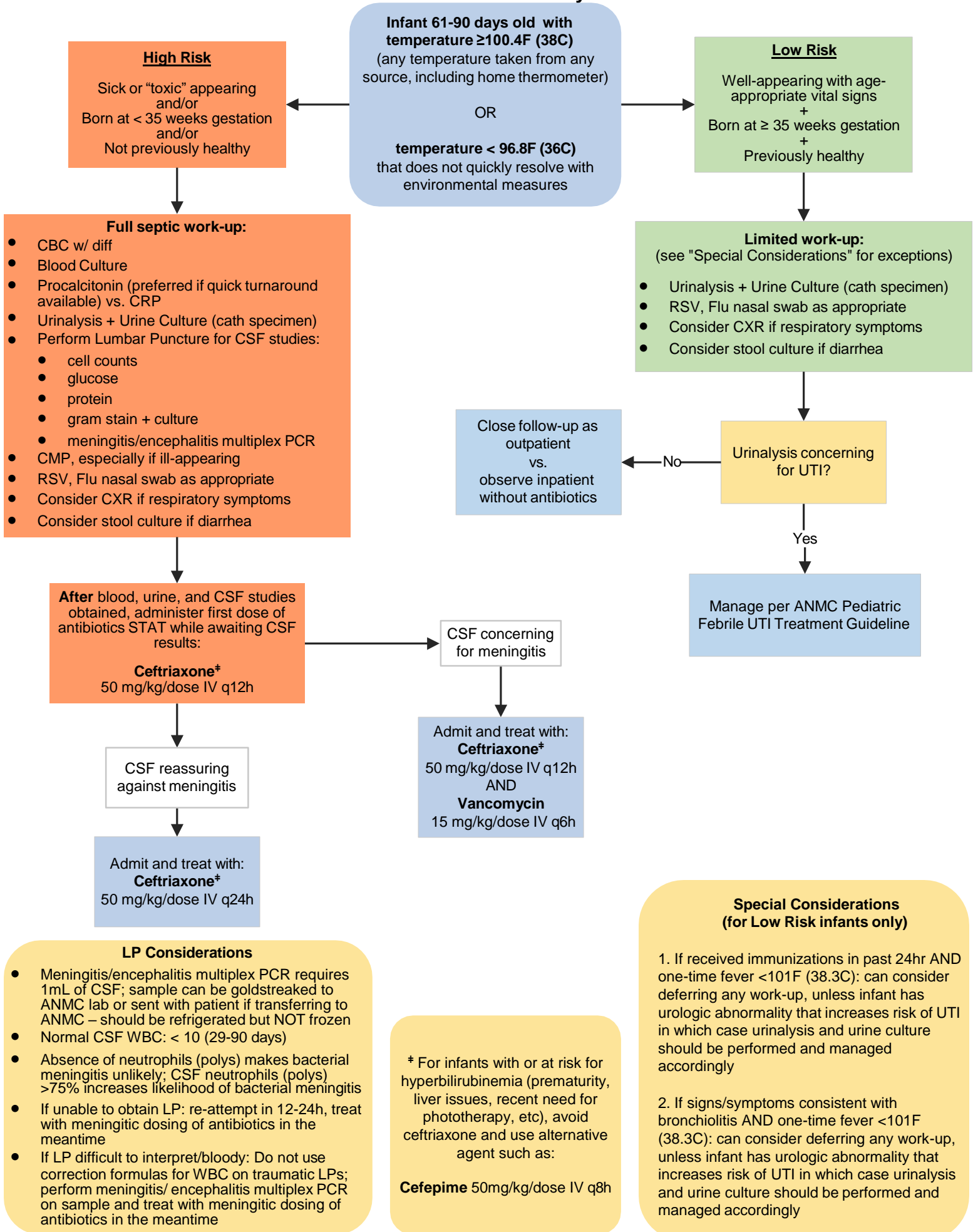
ANMC Fever in Infants 29-60 Days Guideline



Special Considerations (for Low Risk infants only)

- If received immunizations in past 24hr AND one-time fever $< 101^{\circ}\text{F}$ (38.3°C): can consider just urinalysis + urine culture
 - Urinalysis positive: complete partial work-up as above and manage accordingly
 - Urinalysis negative: close outpatient follow-up vs. inpatient observation without antibiotics; return to beginning of guideline if fever recurs
- If signs/symptoms consistent with bronchiolitis AND one-time fever $< 101^{\circ}\text{F}$ (38.3°C): can consider just urinalysis + urine culture; low risk of bacteremia/meningitis
 - Urinalysis positive: complete partial work-up as above and manage accordingly
 - Urinalysis negative: close outpatient follow-up vs. inpatient observation without antibiotics; return to beginning of guideline if fever recurs

ANMC Fever in Infants 61-90 Days Guideline



LP Considerations

- Meningitis/encephalitis multiplex PCR requires 1mL of CSF; sample can be goldstreaked to ANMC lab or sent with patient if transferring to ANMC – should be refrigerated but NOT frozen
- Normal CSF WBC: < 10 (29-90 days)
- Absence of neutrophils (polys) makes bacterial meningitis unlikely; CSF neutrophils (polys) >75% increases likelihood of bacterial meningitis
- If unable to obtain LP: re-attempt in 12-24h, treat with meningitic dosing of antibiotics in the meantime
- If LP difficult to interpret/bloody: Do not use correction formulas for WBC on traumatic LPs; perform meningitis/ encephalitis multiplex PCR on sample and treat with meningitic dosing of antibiotics in the meantime

* For infants with or at risk for hyperbilirubinemia (prematurity, liver issues, recent need for phototherapy, etc), avoid ceftriaxone and use alternative agent such as:

Cefepime 50mg/kg/dose IV q8h

Special Considerations (for Low Risk infants only)

1. If received immunizations in past 24hr AND one-time fever <101F (38.3C): can consider deferring any work-up, unless infant has urologic abnormality that increases risk of UTI in which case urinalysis and urine culture should be performed and managed accordingly
2. If signs/symptoms consistent with bronchiolitis AND one-time fever <101F (38.3C): can consider deferring any work-up, unless infant has urologic abnormality that increases risk of UTI in which case urinalysis and urine culture should be performed and managed accordingly