Admit

**Antibiotic Regimen: Goal within one hour of initial evaluation**

• Ampicillin AND
• Gentamicin OR cefotaxime (consider cefepime as an alternative during shortage)

If suspect bacterial meningitis or with CSF pleocytosis*:
• Always add/include cefotaxime
• May consider vancomycin if high risk for S. aureus

*Definition of CSF Pleocytosis?
1-28 days: CSF WBC ≥18/mm3

If have CSF pleocytosis OR grossly bloody tap (>10,000 RBC) OR high suspicion for HSV OR abnormal neurological exam, ADD:
• Acyclovir

If any one of the following, will go off algorithm:
• Evidence of focal infection
• Known immunodeficiency or cancer
• Patients with central venous catheters or VP shunts
• Meeting criteria for septic shock or severe sepsis, OR if critically ill-appearing

If 22-28 days of age, consider more focused evaluation based on clinical suspicion and low likelihood of HSV or bacterial etiology:
• UA (by microscopy)
• Urine culture (by cath)
• CBC/Diff smear
• Consider inflammatory markers (CRP, procalcitonin if available, evaluate for ANC)

If inflammatory markers are normal, may consider obtaining LP even with +UA

Full Diagnostic Testing
• UA (by microscopy)
• Urine culture (by cath)
• CBC/Diff smear
• CSF studies with culture (defer if unstable)
• Blood culture
• Consider inflammatory markers (CRP, procalcitonin if available, evaluate for ANC)
• Consider AST/ALT
• CXR IF with concern for pneumonia
• Viral studies - perform IF:
  • Resp Pathogen Direct Testing IF with respiratory signs/symptoms
  • HSV studies IF with concern for HSV and/or with CSF pleocytosis, seizures, etc. (see Box A)
  • Enterovirus PCR on blood and CSF IF with CSF pleocytosis OR grossly bloody tap

If no CSF (no LP obtained or unable to obtain CSF) OR traumatic/pleocytosis, admit to the hospital for observation

May consider discharge and observation at home if:
• UA is normal
• No inflammatory markers obtained is abnormal
• CSF is normal or +EV
• Good teaching on home care
• Given a dose of IV ceftriaxone
• Close follow-up within 24 hours

If 22-28 days of age, consider more focused evaluation based on clinical suspicion and low likelihood of HSV or bacterial etiology:
• UA (by microscopy)
• Urine culture (by cath)
• CBC/Diff smear
• Consider inflammatory markers (CRP, procalcitonin if available, evaluate for ANC)

Inflammatory Markers normal?

No, complete full workup

Yes

DISCHARGE CRITERIA:
≤ 28 days of age — may consider discharge at 36 hours if meets all criteria:
• Blood and urine cultures negative at 24-36 hours, CSF cultures negative for two consecutive mornings, CSF HSV PCR negative (if clinically suspicious for HSV, ensure all HSV studies negative)
• Feeding well and well-appearing
• No social or family concerns
• Reliable follow-up in 12-24 hours
• Outpatient plan accepted by family and primary care doctor

If 22-28 days of age, consider more focused evaluation based on clinical suspicion and low likelihood of HSV or bacterial etiology:
• UA (by microscopy)
• Urine culture (by cath)
• CBC/Diff smear
• Blood culture
• Consider inflammatory markers (CRP, procalcitonin if available, evaluate for ANC)

If inflammatory markers are normal, may consider obtaining LP even with +UA

If no CSF (no LP obtained or unable to obtain CSF) OR traumatic/pleocytosis, admit to the hospital for observation

May consider discharge and observation at home if:
• UA is normal
• No inflammatory markers obtained is abnormal
• CSF is normal or +EV
• Good teaching on home care
• Given a dose of IV ceftriaxone
• Close follow-up within 24 hours

Admit

**Consider presumptive testing and treatment if under 3 weeks of age**

Test and treat for HSV if ANY ONE of the following:
1. Suspected HSV infection
2. Severely ill
3. Abnormal neurological exam
4. Vesicular lesions
5. Seizure
6. CSF pleocytosis OR grossly bloody tap (>10,000 RBC)
7. Elevated transaminases/hepatitis
8. Thrombocytopenia
9. Postnatal HSV exposure

Send:
• HSV PCR in CSF and blood
• HSV PCR of vesicles
• HSV culture of conjunctiva, mouth, nasopharynx, and anus

Treat:
Acyclovir

If any one of the following, will go off algorithm:
• Evidence of focal infection
• Known immunodeficiency or cancer
• Patients with central venous catheters or VP shunts
• Meeting criteria for septic shock or severe sepsis, OR if critically ill-appearing

If 22-28 days of age, consider more focused evaluation based on clinical suspicion and low likelihood of HSV or bacterial etiology:
• UA (by microscopy)
• Urine culture (by cath)
• CBC/Diff smear
• Blood culture
• Consider inflammatory markers (CRP, procalcitonin if available, evaluate for ANC)

If inflammatory markers are normal, may consider obtaining LP even with +UA

If no CSF (no LP obtained or unable to obtain CSF) OR traumatic/pleocytosis, admit to the hospital for observation

May consider discharge and observation at home if:
• UA is normal
• No inflammatory markers obtained is abnormal
• CSF is normal or +EV
• Good teaching on home care
• Given a dose of IV ceftriaxone
• Close follow-up within 24 hours

Admit
This guideline should not replace clinical judgment.

Clinical Guideline

Neonatal Fever (Febrile infant, 29-60 days of age)

Pediatric Emergency & Hospital Medicine

Antibiotic Regimen if suspect UTI or no focus identified:
- Ceftriaxone
- Prefer add ampicillin if gram stain of urine demonstrates GPC

If suspect bacterial meningitis or with CSF ≥9WBC/mm³:
- Vancomycin
- Ceftriaxone (unless with hyperbilirubinemia, then cefotaxime)

If have CSF pleocytosis (≥9WBC/mm³) OR grossly bloody tap (>10,000 RBC) OR suspicion for HSV OR abnormal neurological exam ADD:
- Acyclovir

Discharge Criteria:
29-60 days of age — may consider discharge at 24 hours if meets all criteria:
- All cultures negative x 24 hours
- Feeding well and well-appearing
- No social or family concerns
- Reliable follow-up in 12-24 hours

For questions concerning this guideline, contact: chorclinicalguidelines@vcuhealth.org

First approved: August 2018
Last reviewed: April 2022
Next expected update: June 2022
Neonatal Fever Guideline
Executive Summary

Children’s Hospital of Richmond at VCU Neonatal Fever Workgroup

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References


Cincinnati Children's Hospital Medical Center. “Fever of Uncertain Source”. 2010


Citation

Title: Neonatal Fever Guideline

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Date: August 2021

Retrieval website: http://www.chrichmond.org/clinical-pathway-neonatalfever

Example:
Clinical Guideline
Neonatal Fever (Febrile infant, 1–28 days of age)
Pediatric Emergency & Hospital Medicine

This guideline should not replace clinical judgment.

Fever ≥38°C/100.4°F or hypothermia <36°C/96.8°F in patients 1-28 days of age

Full Diagnostic Testing
- UA (by microscopy)
- Urine culture (by cath)
- CBC/Diff smear
- Consider AST/ALT
- Blood culture
- CSF studies with culture (defer if unstable)
- CXR IF with concern for pneumonia
- Viral studies - perform IF:
  - Resp Pathogen Direct Testing IF with respiratory signs/symptoms
  - HSV studies IF with concern for HSV and/or with CSF pleocytosis, seizures, etc. (see Box A)
  - Enterovirus PCR on blood and CSF IF with CSF pleocytosis, or June through November
- Stool culture if with diarrhea

If any one of the following, will go off algorithm:
- Evidence of focal infection
- Known immunodeficiency or cancer
- Patients with central venous catheters or VP shunts
- Meeting criteria for septic shock or severe sepsis, OR if critically ill-appearing

Antibiotic Regimen: Goal within one hour of initial evaluation
- Ampicillin
- Gentamicin OR cefotaxime

If suspect bacterial meningitis or with CSF pleocytosis*:
- Always add/include cefotaxime
- May consider vancomycin if high risk for S. aureus
*Definition of CSF Pleocytosis?
  1-28 days: CSF WBC ≥18/mm3

If have CSF pleocytosis OR grossly bloody tap (>10,000 RBC) OR high suspicion for HSV OR abnormal neurological exam, ADD:
- Acyclovir

Admit

DISCHARGE CRITERIA:
≤ 28 days of age — may consider discharge at 36 hours if meets all criteria:
- Blood and urine cultures negative at 36 hours, CSF cultures negative for two consecutive mornings, CSF HSV PCR negative
- Feeding well and well-appearing
- No social or family concerns
- Reliable follow-up in 12-24 hours
- Outpatient plan accepted by family and primary care doctor

**Consider presumptive testing and treatment if under 3 weeks of age**

A Test and treat for HSV if ANY ONE of the following:
1. Suspected HSV infection
2. Severely ill
3. Vesicular lesions
4. Seizure
5. CSF pleocytosis
6. Elevated transaminases/hepatitis
7. Thrombocytopenia
8. Postnatal HSV exposure

Send:
- HSV PCR in CSF and blood
- HSV PCR of vesicles
- HSV culture of conjunctiva, nasopharynx, and anus

Treat:
Acyclovir

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