# Early recognition of sepsis (Febrile infant, 1–28 days of age)

**Pediatric Emergency & Hospital Medicine** 

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

\*\*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. 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

#### **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 any one of the following, will go off algorithm:

- Evidence of focal infection
- Known immunodeficiency or cancer
- · Patients with central venous catheters or VP
- Meeting criteria for septic shock or severe sepsis, OR if critically ill-appearing

#### **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

#### If 22-28 days of age, consider more focused evaluation based on clinical suspicion and low likelihood of HSV or bacte-rial etiology:

- UA (by microscopy)
- Urine culture (by cath)
- CBC/Diff smear
- Blood culture
- Consider inflammatory markers (CRP, procalcitonin if available, evaluate for ANC)

#### Inflammatory Markers normal?

No complete full workup

Yes

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

Ampicillin

• 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 inflammatory markers are nor-mal, may consider obtaining LP even with +UA

If no CSF (no LP obtained or una-ble 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 ob-tained 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** 

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# Clinical Guideline



This guideline should not replace clinical judgment

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

## **Pediatric Emergency & Hospital Medicine**

Fever >38°C/100.4°F or hypothermia <36°C/96.8°F in patients, AND clinical impression of high risk (e.g. prematurity <37 weeks, underlying medical condition, prolonged NICU stay, not-well appearing)

#### 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

#### **Full Diagnostic Testing**

- UA (by microscopy)
- Urine culture (by cath)
- CBC/Diff smear
- Consider AST/ALT if ≤ 42 days
- 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 (≤ 42 days) IF with concern for HSV and/ or with CSF pleocytosis, seizures, etc. (see Box B)

Antibiotic Regimen if suspect UTI or no focus identified:

If suspect bacterial meningitis or with CSF ≥9WBC/mm³:

• Prefer add ampicillin if gram stain of urine demonstrates GPC

• Ceftriaxone (unless with hyperbilirubinemia, then cefotaxime)

- Enterovirus PCR on blood and CSF IF with CSF pleocytosis, or June through November)
- Stool culture if with diarrhea

#### Limited Testing

- UA (by dip) and urine culture (by cath)
- CBC/Diff smear
- Blood culture
- Consider AST/ALT if ≤ 42 days
- Viral studies (consider respiratory panel with planned admission)
- CXR IF with concern for pneumonia
- \*\*IfT <38.5°C and signs/symptoms of bronchiolitis, may consider deferring work-up and provide symptomatic care\*\*

Consider FULL testing and treatment \*\*\*Obtain CSF prior to ANY antibiotics, if stable\*\*\*

# HIGH RISK FOR SBI (IF WITH ANY POSITIVE OR ABNORMAL RESULT)?

- UA positive for LE/nitrite/pyuria or ≥10 WBC/hpf
- WBC <5,000 or >15,000
- Absolute band count ≥1,500
- OR suspected neonatal HSV (see Box B)
- OR continued clinical impression of high risk

No

Yes

#### LOW RISK FOR SBI:

- No CSF studies needed
- May consider respiratory panel if not yet done

Need for supportive care OR barriers to care or follow-up OR social/family concerns

**Admit** 

Well-appearing AND no barriers to care or follow-up AND no social/family concerns

**DISCHARGETO HOME** 

Follow-up within 12-24 hours

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

Acyclovir

Ceftriaxone

Admit

# B Test and treat for HSV if suspected HSV infection OR if ≤42 days AND any of the following:

- 1. Severely ill
- 2. Vesicular lesions
- 3. Seizure
- 4. CSF pleocytosis
- 5. Elevated transaminases/ hepatitis
- 6. Thrombocytopenia
- 7. Postnatal HSV exposure
- 8. Thrombocytopenia
- 9. Postnatal HSV exposure

#### Send:

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

#### Treat:

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



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# Neonatal Fever Guideline **Executive Summary**

## Children's Hospital of Richmond at VCU Neonatal Fever Workgroup

Pediatric Hospital Medicine Owner: Ashlie Tseng, MD Pediatric Emergency Medicine: Jonathan Silverman, MD Pediatric Infectious Disease Medicine: Jose Muñoz, MD

### **Approved (August 2021)**

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#### References

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# Neonatal Fever Guideline

# **Executive Summary**

#### **Citation**

Title: Neonatal Fever Guideline

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Date: August 2021

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

Example:

Children's Hospital of Richmond at VCU, Tseng A, Silverman J, Muñoz J. Neonatal Fever Guideline. Available from: http://www.chrichmond.org/clinicalguideline-neonatalfever



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AND

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