

**Children's Hospital and Health System, Inc.**  
**Patient Care Treatment Guideline**  
**CW Urgent Care**

**SUBJECT: Febrile Neonate (up to 60 days of age)**

**Purpose:** To evaluate and initiate treatment of the febrile neonate (up to 60 days).

*Febrile infants (temperature  $\geq 38.0^{\circ}\text{C}/100.4^{\circ}\text{F}$ , either documented at home or in clinic) up to 60 days of age evaluated in Children's Urgent Care should be referred to the CW Emergency Department.\**

*\*If the infant was discharged from CW for a febrile workup within the past 72 hours, please page the PMD for guidance.*

**Definition:** Fever in very young infants is a common and important problem. Neonates have unique vulnerabilities to infection because of their immature immune systems and incomplete barriers to invasion. Unlike older infants and children, even well appearing young infants are at increased risk for invasive infections due to bacteria or HSV. Repeated studies have shown that clinical exam alone is unreliable in predicting serious illness in this age group. Therefore, the combination of history, exam, and diagnostic tests must be utilized for all febrile young infants to determine the infant's risk of serious infection. All infants less than 60 days of age with fever require additional evaluation, beyond the scope of care provided in urgent care, to determine appropriate management.

**Etiology:** Fever in young infants can be caused by typical viral infections. However, young infants are at increased risk for invasive bacterial infections (IBIs). The rate of IBIs in febrile young infants are estimated to be 7-13.5% in various studies. The causative organisms involved in bacterial infections in young infants have changed over the last 40 years. Prenatal GBS screening has led to a decline in Group B Strep as a causative agent, immunization against *S pneumoniae* has reduced the incidence of invasive pneumococcal disease due to herd immunity, and improved food safety has led to a decline in *Listeria monocytogenes* infections in this age group. *Escherichia coli* is now the leading cause of bacteremia and either the leading or second most common cause (behind GBS) of bacterial meningitis. This shift from Gram-positive to a Gram-negative organism as the leading cause of invasive bacterial infections affects which tests are most helpful in determining the likelihood of infection, the interpretation of test results, and antibiotic selection.

In addition to bacterial etiologies, HSV can cause serious morbidity and mortality in this age group. Affected infants may present with cutaneous findings (skin, eye, mouth), meningoencephalitis, or disseminated disease.

**Differential Diagnosis** (for Invasive Bacterial Infections)

- UTI (most common IBI in this age group)
- Bacteremia
- Meningitis
- Bacterial diarrhea
- Pneumonia

**Guideline**

**Subjective Data/History**

- Onset of fever
- T-max of fever
- Route taken
- Associated symptoms
- Use of antipyretic medication
- Birth history
- Bundling
  - When ambient temperature and humidity permit normal heat loss (i.e.. humidity < 75%, ambient temperature < 35°C/95°F), an elevated rectal temperature  $\geq 38^{\circ}\text{C}/100.4^{\circ}\text{F}$  should **not** be attributed to bundling in infants 7-90 days of age.
  - Temperature  $\geq 38.5^{\circ}\text{C}/101^{\circ}\text{F}$  should **not** be attributed to bundling regardless of the manner taken.

**Objective Data/Physical Exam**

- Assess for signs/symptoms to suggest serious illness
- Complete vital signs, including rectal temperature, pulse oximetry, and blood pressure are necessary on these infants to aid in determining appropriate method of transfer to the emergency department.
- Hydration status
- Respiratory effort

**Diagnostic Studies:** Diagnostic studies are utilized to aid in clinical decision making for young infants presenting with fever. The exact testing recommended will vary based on the infant's age and clinical presentation. Emergency Department testing may include:

- Urinalysis and urine culture
- Blood culture
- Inflammatory markers (CBC with diff, CRP, procalcitonin)
- Lumbar puncture
- HSV studies (CSF PCR, HSV surface swabs of mouth, nasopharynx, conjunctivae, anus for culture or PCR), ALT, and blood PCR.
- Additional testing may also include (if indicated): Viral panel, chest x-ray, stool studies

**Treatment:**

- **An infant 60 days or younger with a documented temperature at or above 38.0°C/100.4°F, either at home or in the office, regardless of health status, should be transferred to CW Emergency Department (preferred).\*\***
- ***If the infant appears healthy, vitals and exam are not concerning for decompensation, and the family is responsible and able, may go to CW ED (preferred) by car.***
- If the infant is ill appearing, arrange transfer by ambulance.
- Provide BLS to support the infant while awaiting transport.

**\*\* Note:** for infants with a history tactile temperature only, with no measured documented temperature of 38°C or above, provider discretion may be used regarding transfer only if all of the following conditions are met:

- No antipyretic given
- History does not suggest increased risk for bacterial infection (no perinatal risk factors such as prematurity, prolonged rupture of membranes, no maternal GBS colonization), normal behavior and feeding, no difficulty breathing, apnea, color change
- Normal appearance and physical exam
- Reliable follow up in 12-24 hours
- Caregivers can obtain and monitor rectal temp at home, understand when to seek medical attention, and have the transportation to do so

**Education of Patient/Family:** The evaluation and management plan for infants with fever will vary based on infant’s age, history and appearance, as well as current emergency department protocols. Infants less than 21 days of age will always be admitted to the hospital. Infants 22-28 days of age are also almost always admitted, although rarely may be managed as outpatients if all diagnostic testing is reassuring and close follow up can be ensured. Infants 29 to 60 days old may be managed as inpatient or outpatient (with close follow up), with shared decision making after testing is performed and interpreted.

For additional details, see the American Academy of Pediatrics “Evaluation and Management of Well-Appearing Febrile Infants 8 to 60 Days Old”. Pediatrics Volume 148, number 2, August 2021: e2021052228.

---

Amy Romashko, MD  
Medical Director, CW Urgent Care

*This guideline is designed to serve as a reference for clinical practice and does not represent an exclusive course of treatment nor does it serve as a standard of medical care. Providers should apply their professional judgment to the management of individual patient conditions and circumstances. Children’s Hospital and Health System (CHHS) does not make any representation with respect to any sort of industry recognized standard of care for the particular subject matter of this clinical guideline. Additionally, CHHS form documents are subject to change, revision, alteration, and/or revocation without notice.*

Supersedes 6/2015, 7/2018

Approved by UC Clinical Practice Council and Medical Director 12/2021

Next review due 12/2024

References

Greenhow, T., Hung, Y., Herz, A. (2012) Changing epidemiology of bacteremia in infants aged 1 week to 3 months. *Pediatrics*. 2012 Mar;129(3):e590-6.

Greenhow, T., Hung, Y., Losada, E., Pantell, R. (2014). The changing epidemiology of serious bacterial infections in young infants. *Pediatr Infect Dis J*. 2014 Jun;33(6):595-9. doi: 10.1097/INF.0000000000000225.

Huppler, A.R., Eickhoff, J.C., & Wald, E.R. (2010). Performance of low-risk criteria in the evaluation of young infants with fever: Review of the literature. *Pediatrics*, 125(2), 228-233.

Pantell, R, Roberts, K et al. Subcommittee on Febrile Infants. (2021). Evaluation and Management of Well Appearing Febrile Infants 8 to 60 Days Old. *Pediatrics*, Volume 148, number 2, August, 2021:e2021052228.

Scarfone, R., Gala, R., Murray, A., Funari, M.K., Lavelle, J., & Bell, L. (July 2021). ED pathway forevaluation/treatment of febrile young infants (0-56 days old). *The Children's Hospital of Philadelphia*. Retrieved from <https://www.chop.edu/clinical-pathway/febrile-infant-emergent-evaluation-clinical-pathway>

Schmidt, S. et al. (2018). Children's Hospital Colorado Clinical Pathway: Fever in Infants Less than 60 days. Retrieved from <https://www.childrenscolorado.org/49e72a/globalassets/healthcare-professionals/clinical-pathways/fever-in-infants-less-than-60-days.pdf>

Smitherman, H.F., & Macias, C.G. (2021). Febrile infant (younger than 90 days of age): Definition of Fever. *UpToDate*. Retrieved from <http://www.uptodate.com>.

*Treatment information also provided by Michael Levas, MD, Assistant Professor of Pediatrics, Emergency Medicine, Children's Wisconsin (personal communication, April 2015);*

Supersedes 6/2015, 7/2018

Approved by UC Clinical Practice Council and Medical Director 12/2021

Next review due 12/2024

## UC EVIDENCE BASED GUIDELINE: FEBRILE NEONATE

*Julie Kolinski, MD, Hospital Medicine, Children's Wisconsin (personal communication, September 2017); John Cox, MD, Assistant Professor of Pediatrics, Emergency Medicine, Children's Wisconsin (personal communication, July 2018); Amy Drendel, DO, Medical Director, CW Emergency Department, Associate Professor of Pediatrics, Emergency Medicine, Children's Wisconsin (personal communication, July 2018 and January 2022).*

Supersedes 6/2015, 7/2018

Approved by UC Clinical Practice Council and Medical Director 12/2021

Next review due 12/2024