



Environmental Disease Case Reporting and Investigation Protocol
INFANT METHEMOGLOBINEMIA

I. IDENTIFICATION AND DEFINITION OF CASES

- A. **Clinical Description:** Infant methemoglobinemia, also known as “blue baby syndrome,” is a blood disorder that impairs the transport of oxygen to body tissues. Symptoms include, but are not limited to, bluish appearance of skin (cyanosis), anxiety, headache, rapid heartbeat, confusion, shortness of breath, nausea, diarrhea, lethargy, loss of consciousness, seizures, and cyanosis. A high percentage of methemoglobin in the blood can lead to death.

Infant methemoglobinemia can be inherited or acquired. Acquired methemoglobinemia is more common and can be caused by a variety of sources, including some medications (e.g., benzocaine, dapsone), food or water containing high levels of nitrate, and chemicals (e.g., aniline, naphthalene). Some health conditions, such as anemia, milk protein intolerance, severe metabolic acidosis, and urinary tract infections, can increase an infant’s susceptibility to methemoglobinemia.

B. **Laboratory Criteria:**

Confirmatory: Blood methemoglobin $\geq 1.5\%$.

C. **Wisconsin Case Definition:**

A clinically-compatible illness that is laboratory confirmed, occurring in an infant aged 12 months or less.

II. REPORTING

- A. **Wisconsin Disease Surveillance Category II – Methods for Reporting:** This disease shall be reported to the patient’s local health officer or to the local health officer’s designee within 72 hours of recognition of a case or suspected case, per Wis. Admin. Code § [DHS 145.04\(3\)\(b\)](#). Report electronically through the Wisconsin Electronic Disease Surveillance System (WEDSS), or mail or fax a completed Acute and Communicable Disease Case Report ([F-44151](#)) to the address on the form.

- B. **Responsibility for Reporting:** According to Wis. Admin. Code § [DHS 145.04\(1\)](#), persons licensed under Wis. Stat. ch. [441](#) or [448](#), laboratories, health care facilities, teachers, principals, or nurses serving a school or day care center, and any person who knows or suspects that a person has a notifiable condition identified in [Appendix A](#).

- C. **Clinical Criteria for Reporting:** Clinical diagnosis in an infant aged 12 months or less.

- D. **Laboratory Criteria for Reporting:** Laboratory evidence of infant methemoglobinemia, defined as a methemoglobin level $\geq 1.5\%$ in a blood sample in an infant aged 12 months or less.

III. CASE INVESTIGATION

- A. **Responsibility for case investigation:** It is the responsibility of the local health department (LHD) to request the medical records for suspect cases as soon as is reasonably possible. The medical records should be uploaded into WEDSS. The Bureau of Environmental and Occupational Health (BEOH) performs case investigations unless local health departments choose to conduct routine follow-up for all cases in their jurisdictions. A case investigation may include information collected by phone, in-person, in writing, or through review of medical records or disease report forms, as necessary and appropriate.

B. **Required Documentation:**

1. As detailed in the [Infant Methemoglobinemia Memo](#), upload medical records for suspect infant methemoglobinemia cases into WEDSS.
2. Upon completion of medical record upload, set WEDSS disease incident process status to “Sent to State.”

IV. PUBLIC HEALTH INTERVENTIONS AND PREVENTION MEASURES

- A. Local public health should provide routine education to the public on ways to prevent methemoglobinemia,

including the following:

- Infants under 12 months of age that eat foods high in nitrate or drink nitrate-contaminated water are at increased risk of methemoglobinemia.
- Infant methemoglobinemia can be also caused by certain medications (e.g., benzocaine, dapson) and chemicals (e.g., aniline, naphthalene).
- Some health conditions, such as anemia, milk protein intolerance, severe metabolic acidosis, and urinary tract infections, can increase an infant's risk of methemoglobinemia.
- Test private wells for nitrate to ensure that water is safe to drink.
- When nitrate levels in a private well are high (above 10 mg/L), the water should not be given to babies less than 6 months old or used to make infant formula.
- If a private well has high nitrate levels (above 10 mg/L), then women who are or may become pregnant should stop using the water for drinking and preparing foods that use a lot of water.
- Be aware of symptoms of infant methemoglobinemia, which can include bluish appearance of skin, rapid heartbeat, shortness of breath, nausea, diarrhea, lethargy, loss of consciousness, and seizures.
- If the skin color of an infant appears bluish or gray, call 911 emergency services or call the Wisconsin Poison Center at 1-800-222-1222.

V. CONTACTS FOR CONSULTATION

- A. Local health departments and tribal health agencies: <https://www.dhs.wisconsin.gov/lh-depts/counties.htm>
- B. Medical management of methemoglobinemia: Wisconsin Poison Center: 1-800-222-1222
- C. Wisconsin Bureau of Environmental and Occupational Health: 608-266-1120

VI. RELATED REFERENCES

- A. Rehman HU. Methemoglobinemia. *West J Med.* 2001;175(3):193-196.
- B. Skold A, Cosco D.L., Klein R. Methemoglobinemia: pathogenesis, diagnosis, and management. *South Med J.* 2011;104(11):757-761.
- C. Umbreit J. Methemoglobin—it's not just blue: a concise review. *Am J Hematol.* 2007;82(2):134-144.