

## LOW HEMOGLOBIN

### I. DEFINITION:

A laboratory value in which concentration of hemoglobin (Hgb) is less than the values indicated for a given age.

### II. ETIOLOGY AND EPIDEMIOLOGY:

Anemia may result from excessive blood loss, excessive blood cell destruction, or decreased blood cell formation. The latter anemia may result from inhibition of or loss of bone marrow function, defective nucleoprotein synthesis (as in pernicious anemia), or deficiency of iron in the diet.

### III. CLINICAL FEATURES:

A. Mild to Moderate iron deficient anemia may be asymptomatic or have nonspecific complaints of:

1. Poor appetite, inadequate diet, or anorexia
2. Fatigability, listlessness, decreased social interaction, poor attention to tasks, developmental delays.
3. Poor weight gain.

B. Children with severe iron deficiency anemia (Hgb  $\leq$  6g/dL) may exhibit:

1. Pallor (best seen in conjunctiva)
2. Fatigue
3. Irritability
4. Tachycardia
5. Dyspnea with exercise

C. Inquire about dietary history and other health history related to low hemoglobin:

1. Consumption of tea or other caffeine containing beverages
2. History of intestinal parasites
3. History of blood loss including GI bleeding or nose bleeds
4. History of sickle cell anemia or thalassemia, lead exposure/poisoning, Vitamin B12 or folate deficiency, or other chronic illness.
5. Pica (can be a symptom of iron deficiency anemia and/or lead poisoning; iron deficiency anemia increases risk for lead poisoning)
6. Excessive cow's milk/dairy intake (> 16 oz/day in children) and limited intake of iron-containing foods
7. Gestational severe maternal iron deficiency, maternal hypertension and maternal diabetes mellitus can result in low fetal iron stores
8. Infants four months and older and exclusively fed human milk without iron supplementation (e.g., iron fortified cereals, oral, pureed meats)
9. Non-iron fortified milk product during infancy
10. Delayed weaning

IV. MANAGEMENT PLAN:

- A. Perform hematological testing according to agency procedure and program guidelines.
- B. Any initial low value must be validated by repeating testing. Document each test in the record.
- C. Refer all persons tested according to the levels listed in the Appendix to their primary care provider for possible iron therapy using the Referral Form, ODH 399.
- D. Evaluate need for testing of blood lead levels (see Physician Approved Protocol).
- E. Evaluate need for testing of Hemoglobinopathies (see Physician Approved Protocol)
- F. Certify for WIC if eligible and refer to public health nutritionist same day that low Hgb is identified or as soon thereafter as possible or refer to community resource if no nutritionist in the county.
- G. Refer for Physician Management
  - 1. All infants below 6 months of age.
  - 2. Child of any age with history of blood loss, tarry stools, fainting, jaundice or weakness.
  - 3. Hgb values exceeding 16 g/dl should be referred to the physician for evaluation.
- H. Client Education
  - 1. Counsel related to iron deficiency anemia.
  - 2. Counsel parents on food sources which are high in iron. Iron fortified cereal for babies starting at 4-6 months and continuing through first year of life.
  - 3. Counsel on exclusive breastfeeding for the first 4 to 5 months of life; If formula fed, only iron-fortified formula should be used. Instruct parents to continue breastfeeding or iron fortified formula or throughout the first year of life.
  - 4. Emphasize no whole cow's milk (or anything other than human milk or iron-fortified formula) during the first year of life.
  - 5. Limit milk (cow's milk, goat's milk, soy milk) to a total daily intake of 24 oz./day once the child is over 12 months of age.
  - 6. Counsel on foods high in Vitamin C and encourage adequate intake of Vitamin C.
- I. Follow-up

Determine tracking priority utilizing professional judgment.

## APPENDIX

### Referral Levels for Low Hemoglobin

<u>Age</u>	<u>Hgb</u>
<b>Children</b> (age, in years)	
6 months -<2 *	11.0
2-<5	11.1
5-<8	11.5
8-<12	11.9
<b>Males</b> (age, in years)	
12-<15	12.5
15-<18	13.3
18 & >	13.5
<b>Nonpregnant women and lactating women</b> (age, in years)	
12-<15	11.8
15-<18	12.0
18 & >	12.0

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\*Although no data are available to determine the maximum hemoglobin concentration for anemia among infants, the values listed for children aged 1-<2 years can be used for infants aged 6-12 months.

Source: Centers for Disease Control and Prevention. Recommendations to Prevent and Control Iron Deficiency in the United States. MMWR 1998;47(No. RR-3):[p.12].

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