



Child and Teen Checkups (C&TC) FACT Sheet

For Primary Care Providers

Hematocrit or Hemoglobin

| C&TC Requirements: | Qualified Personnel | Documentation |
|---|---|---|
| <p>Hematocrit or hemoglobin:</p> <p>Use either a micro hematocrit determination, hemoglobin concentration test or an erythrocyte protoporphyrin test for anemia.</p> | <p>Physician</p> <p>Nurse Practitioner</p> <p>Physician Assistant</p> <p>Nurse</p> <p>Certified Medical Assistant</p> <p>Lab Technician</p> | <p>Document lab tests ordered.</p> <p>It is not necessary to have a complete record of lab test results on documentation form. Lab test results may be found elsewhere in the chart. Form could indicate where this information can be found.</p> |

Facts about Iron-deficiency Anemia:

- Iron deficiency is the most common nutritional deficiency. It has negative effects on motor and mental development in infants, children, and adolescents [1].
- In an NHANES survey (1999-2000), persons with iron deficiency (as defined as an abnormal value for at least two of the following three indicators: serum ferritin, transferrin saturation, and free erythrocyte protoporphyrin) and a low hemoglobin value were considered to have iron deficiency anemia [1].
- Maternal iron deficiency anemia might cause low birthweight and preterm delivery [1].
- A significant prevalence has been observed in the United States among certain populations, such as toddlers and females of childbearing age [1].
- The prevalence of iron deficiency was approximately two times higher among non-Hispanic black and Mexican-American females (19%–22%) than among non-Hispanic white females (10%) [1].
- Among children, iron deficiency is seen most often between 6 months and 3 years of age due to rapid growth and inadequate intake of dietary iron. Infants and children at highest risk are the following groups:
 - Babies who were born early or small
 - Babies given cow's milk before age 12 months
 - Breastfed babies who after age 6 months are not being given plain, iron-fortified cereals or another good source of iron from other foods
 - Formula-fed babies who do not get iron-fortified formulas

- Children aged 1–5 years who get more than 24 ounces of cow, goat, or soymilk per day -- excess milk intake can decrease a child’s desire for food items with greater iron content, such as meat or iron fortified cereal
- Children who have special health needs, for example, children with chronic infections or restricted diets [2].

Screening Tools:

Three basic methods are used to determine hemoglobin levels and hematocrits: venipuncture with analysis by automated cell counter, capillary sampling with analysis by hemoglobin meter, or capillary sampling with microhematocrit analysis by centrifuge. (NOTE: The microhematocrit method yields slightly higher values and is somewhat less sensitive than the automated cell counter method. The capillary methods may provide less reliable results because of greater variation in sampling technique than venipuncture.)

If the capillary method is used, observe the following principles of collection:

- In infants, the best sites are the medial and lateral aspects of the plantar surface of the heel. In older children, the best sites are the medial and lateral aspects of the pulp of a finger; make the puncture perpendicular to the skin and across the dermal ridges.
- To increase blood flow and accuracy of the test, make sure the heel or finger is warm.
- Before puncture, clean the site with an antiseptic and allow it to dry.
- Use sterile, disposable lancets with tips less than 2.5 mm long for infants aged 6 months or younger. Lancets with longer tips (up to 5 mm) may be used for older children. Wipe away the first two to three drops of blood, which contain tissue fluids, with dry gauze. Do not milk or squeeze the puncture site, because this may cause hemolysis and admixture of tissue fluids with the specimen [3].

Hemoglobin and Hematocrit Cut Points for Anemia in Children 1 Year of Age or Older

| Gender | Age in years | Hemoglobin, g/dL | Hematocrit, % |
|--------------|--------------|------------------|---------------|
| Both genders | 1 – 1.9 | 11.0 | 33.0 |
| | 2 – 4.9 | 11.2 | 34.0 |
| | 5 – 7.9 | 11.4 | 34.5 |
| | 8 – 11.9 | 11.6 | 35.0 |

From Clinician’s Handbook of Preventive Services (2nd ed.) [3]

Professional Recommendations:

American Academy of Pediatrics – Screening should be performed between 9 and 12 months and with additional screening between the ages of 1 and 5 years for patients at risk. All menstruating adolescents should be screened annually.

American Academy of Family Physicians and US Preventive Services Task Force (USPSTF) -- Hemoglobin concentration screening should be performed between 6 and 12 months of age for infants in high-risk groups. The AAFP and USPSTF define high-risk groups as infants living in poverty; African Americans; American Indians; Alaska Natives; immigrants from developing countries; preterm and low-birth-weight infants; and infants whose principal intake is unfortified cow's milk.

Bright Futures / Centers for Disease Control and Prevention –
Universal Screening for Infants and Children at High Risk

- At ages 9 to 12 months, 6 months later (at 15 to 18 months), and annually from ages 2 to 5 years, screen those at high risk for iron-deficiency anemia, including:
 - Infants and children in families with low incomes
 - Infants and children who are eligible for WIC
 - Infants and children who are migrants or recently arrived refugees

Resources: (Accessed October 3, 2007)

- American Academy of Pediatrics. (March 2000) Recommendations for Preventive Pediatric Health Care (RE9939) Pediatrics,105, 3. [On-line] available: <http://www.aap.org/policy/re9939.html>
- Story M., Holt K, Sofka D. eds. (2000) Bright Futures in Practice: Nutrition (2nd ed.). Arlington, VA: National Center for Education in Maternal and Child Health. . [On-line], available: <http://www.brightfutures.org/nutrition/pdf/concerns.pdf>.
- American Medical Association. Guidelines for Adolescent Preventive Services. [On-line], available: <http://www.ama-assn.org/ama/pub/category/1980.html>.
- Minnesota Department of Health, Maternal and Child Health Section. For questions, training, or additional information, contact the C&TC Training Coordinator at (651) 201-3760. Website: <http://www.health.state.mn.us/divs/fh/mch/candtc.html>
- Minnesota Department of Human Services C&TC Documentation Forms, Criteria Guidelines for C&TC Provider Documentation (2006). C&TC FACT Sheets [Online] available: <http://www.dhs.state.mn.us/provider/ctc>.

References: (Accessed October 3, 2007)

1. Department of Health and Human Services. Center for Disease Control and Prevention. (2000) Morbidity and Mortality Weekly Report (MMWR)Vol.51/No.40. Iron deficiency – United States, 1999-2000. [Online] available: <http://www.cdc.gov/mmwr/PDF/wk/mm5140.pdf>.
2. Department of Health and Human Services. Center for Disease Control and Prevention.(2007).Nutrition for everyone.[Online] available: http://www.cdc.gov/nccdphp/dnpa/nutrition/nutrition_for_everyone/iron_deficiency/#Risk.
3. U. S. Public Health Service. (1998). Clinician’s Handbook of Preventive Services (2nd ed.) McLean, VA: International Medical Publishing. [On-line] available: <http://www.ahepr.gov/clinic/ppiphand.htm>.