Hemoglobin or Hematocrit

CHILD AND TEEN CHECKUPS (C&TC) FACT SHEET FOR PRIMARY CARE PROVIDERS

C&TC Requirements

General
The following are C&TC requirements for Hemoglobin (Hb) or Hematocrit (Hct) screening:

- One baseline Hb or Hct screening is required between 9 and 15 months of age.
- One Hb or Hct screening is required between 12 and 20 years of age for all menstruating females.

Personnel
Physician, nurse practitioner, physician assistant, registered nurse, medical assistant, or lab technician may complete the screening.

Documentation
It is not necessary to have a complete record of laboratory test results on the documentation forms. Test results may be found elsewhere in the chart but documentation forms should indicate where this information can be found. For more information, refer to MHCP Provider Manual - Child and Teen Checkups (www.dhs.state.mn.us).

Procedure
Three basic methods are used to determine Hb concentration and Hct level:

- Venipuncture with analysis by an automated cell counter,
- Capillary sampling with analysis by a hemoglobin meter, or
- Capillary sampling with a micro hematocrit analysis by centrifuge.

If the capillary method is used, refer to the CDC Capillary Blood Sampling Protocol.

Hb / Hct values to define anemia

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Hb (&lt;g/dl)</th>
<th>Hct (&lt;%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both</td>
<td>6 months – 2 years</td>
<td>11.0</td>
<td>32.9</td>
</tr>
<tr>
<td>Both</td>
<td>2 – 5 years</td>
<td>11.1</td>
<td>33.0</td>
</tr>
<tr>
<td>Both</td>
<td>5 – 8 years</td>
<td>11.5</td>
<td>34.5</td>
</tr>
<tr>
<td>Both</td>
<td>8 – 12 years</td>
<td>11.9</td>
<td>35.4</td>
</tr>
<tr>
<td>Females (non-pregnant)</td>
<td>12–15 years</td>
<td>11.8</td>
<td>35.7</td>
</tr>
<tr>
<td>Females (non-pregnant)</td>
<td>15-18 years</td>
<td>12.0</td>
<td>35.9</td>
</tr>
<tr>
<td>Females (non-pregnant)</td>
<td>≥18 years</td>
<td>12.0</td>
<td>35.7</td>
</tr>
</tbody>
</table>

(Centers for Disease Control and Prevention, 1998). Note, Hb and Hct values may vary depending on the laboratory or specific test used.

Follow-up
All infants and youth with Hb or Hct values below the cutoffs per age on the above table should have further evaluation and follow-up. Refer to the recommendations in the Clinic Report - Diagnosis and Prevention of Iron Deficiency and Iron-Deficiency Anemia in Infants and Young Children (www.pediatrics.aappublications.org).

Importance of Screening
Iron deficiency (ID) is the most common nutritional deficiency in the world. Iron Deficiency Anemia (IDA) is a common cause of anemia in young children (Baker & Greer, 2010).

IDA is associated with psychomotor and cognitive abnormalities in children. Infants and
toddlers in the following groups are at highest risk for ID and IDA (Baker & Greer, 2010):

- History of prematurity or low birth weight.
- Lead exposure.
- Weaning to cow’s milk and or formulas with low-iron or no iron before 12 months.
- Exclusive breastfeeding beyond 4 months of age without supplemental iron.
- Children of low socioeconomic status or with special health needs, feeding problems, or poor growth and development and inadequate nutrition.
- Data from Minnesota’s WIC program shows that American Indian infants and infants of color have higher incidence of anemia compared to white children (Minnesota Department of Health, 2017).

The 2012 US National Health and Nutrition Examination Surveys (NHANES) reported for females, ages 12 to 14 years, Non-Hispanic Black had a 17.8% prevalence of anemia in comparison to 1.8% of white and 4.9% of Hispanic females. In non-pregnant females 15 to 29 years of age, 3.6% of White Non-Hispanic had anemia compared to 21.5% of Black and 8.6% of Hispanic females (Huu, 2016).

Professional Recommendations

American Academy of Pediatrics

The AAP recommends universal screening of Hb concentration at approximately 1 year of age. This should include an assessment of risk factors associated with ID/IDA. (Baker & Greer, 2010)

Resources

American Academy of Pediatrics

- Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents (www.brightfutures.aap.org)