Hemoglobin/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) and 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).

Screening 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 capillary method is used, observe the following principles of collection:
- Warm the heel or finger in order to ensure good blood flow and accuracy of the test. Before puncture, clean the site by washing with soap and drying with clean, low-lint towel, or if unavailable, use an alcohol wipe (Centers for Disease Control and Prevention, 1997).

Below is a reference table of Hb concentration and Hct values used to define anemia when screening children for iron deficiency and iron deficiency anemia (Centers for Disease Control and Prevention, 1998). Note, Hb and Hct values may vary from this chart depending on the laboratory or specific test used.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Hb (&lt;g/dl)</th>
<th>Hct (%)</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>Males</td>
<td>12 - 15 years</td>
<td>11.8</td>
<td>35.7</td>
</tr>
<tr>
<td>Males</td>
<td>15 - 18 years</td>
<td>13.3</td>
<td>39.7</td>
</tr>
<tr>
<td>Males</td>
<td>≥18 years</td>
<td>13.5</td>
<td>39.9</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>

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).
▪ Infants born to mother with IDA, diabetes, or pregnancy-induced hypertension with intrauterine growth restrictions during pregnancy.
▪ Infants born prematurely or with low birth weight.
▪ Infants fed cow’s milk and/or formulas with low-iron or no iron before 12 months.
▪ Infants exclusively breastfed beyond 4 months without supplemental iron.
▪ Children aged one to five years who consume more than 24 ounces of cow, goat, or soy milk per day.
▪ Children with special health needs, feeding problems, or poor growth and development and inadequate nutrition.
▪ Data from Minnesota’s WIC program shows that infants of color and American Indian infants have higher incidence of anemia compared to white children (Minnesota Department of Health, 2015).

Adolescent females and young adult women in the following groups are at the highest risk for ID and IDA:
▪ Menstruating females, especially those with heavy menstrual blood loss (>80 ml/month).
▪ Adolescent females with increased need for iron due to rapid growth during puberty.
▪ Adolescent females and young adult women with a history of or existing eating disorders.
▪ Adolescent females and young adult women who are dieting to control weight.

**Follow-up**

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

**Professional Recommendations**

American Academy of Pediatrics (AAP)

▪ The AAP recommends universal screening for anemia with determination of Hb concentration at approximately 1 year of age. This should include an assessment of risk factors associated with ID/IDA.

**Resources**

American Academy of Pediatrics (AAP)
▪ *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents* (www.brightfutures.aap.org)

Minnesota Department of Human Services (DHS)
▪ *MHCP Provider Manual - Child and Teen Checkups* (www.dhs.state.mn.us)

Minnesota Department of Health (MDH)
▪ *Women, Infants and Children (WIC) Program* (www.health.state.mn)
▪ *Child and Teen Checkups Program* (www.health.state.mn.us)

**References**


**For More Information**

Minnesota Department of Health Child and Teen Checkups Program
PO Box 64882,
St. Paul, MN 55164-0882
(phone) 651-201-3760
health.childandteencheckups@state.mn.us
www.health.state.mn.us

Revised: 1/2017
To obtain this information in a different format, call: 651-201-3760.