

ANEMIA

I. INTRODUCTION

Anemia is defined as a reduction in either the percentage of red blood cells (hematocrit), or a reduction in the concentration of hemoglobin in a sample of venous blood when compared with reference values.

II. CLIENT SELECTION

Iron deficiency is the most common anemia in the general population. The prevalence of iron deficiency is about 2% in males and 12% in women of reproductive age. Black and Hispanic women are at high risk for iron deficiency (~20%). This type of deficiency can result from blood loss or inadequate dietary intake of iron. Iron deficiency occurs when body iron stores become inadequate for red blood cell production. Women are particularly at risk due to iron losses during pregnancy and menstruation. Hormonal contraceptives that reduce menstrual bleeding are beneficial to women who have a tendency toward iron deficiency.

III. MEDICAL EVALUATION AND SCREENING

The first laboratory evidence of iron deficiency is a low serum ferritin. A value less than 30 micrograms per liter nearly always indicates absent iron stores and is a highly reliable indicator of iron deficiency. The serum iron binding capacity rises, and the serum iron values fall (Appendix A).

To make the diagnosis of iron deficiency anemia, one can either demonstrate an iron-deficient state or evaluate the response to a therapeutic trial of iron replacement. For women of reproductive age, a therapeutic trial of oral iron therapy is the recommended initial approach.

IV. PLAN OF ACTION

- A. Clients who attend family planning clinics should have hemoglobin and/or hematocrit studies done under the following circumstances:
 - 1. At the initial comprehensive visit if there are signs or symptoms of anemia or at the provider's discretion if a woman is from a group at high risk for anemia such as poor nutritional status, menorrhagia, GI inflammatory disorders
 - 2. When presenting with a history, signs or symptoms of anemia
 - 3. If required for the provision of a contraceptive method
- B. In general, a hemoglobin concentration less than 11 g/dL or a hematocrit less than 33% should prompt further evaluation: on-site or by referral, which includes a complete blood count (CBC), red blood cell indices and reticulocyte count.

- C. Appropriate treatment for iron deficiency anemia is a daily dose of 60-180 mg of oral elemental iron: in the form of ferrous sulfate, ferrous gluconate, or ferrous fumarate).
- D. Nutrition counseling and an iron-rich food list should be provided (Appendix B). Iron from meat, poultry or fish is absorbed more efficiently than iron from plant sources. Foods containing vitamin C (see Appendix B) also enhance iron absorption from plant sources when eaten at the same meal. Coffee, tea, colas, whole grains, legumes, dairy products and calcium pills decrease the amount of iron from plant sources absorbed at each meal.
- E. A client with a hemoglobin concentration less than 10 g/dL or a hematocrit less than 30% should be referred to a physician for consultation. Additional testing might include serum ferritin, serum iron and total iron-binding capacity.
- F. An unusually high hematocrit may be due to smoking, dehydration, or stress polycythemia. If the hematocrit is greater than 49%, polycythemia vera should be considered because combined hormonal contraceptives are contraindicated in this rare disease. Medical consultation should be obtained.
- G. Any hormonal contraceptive may be used to decrease menstrual blood loss when excessive menstrual flow is a contributing factor for anemia.

V. FOLLOW-UP

- A. An increase in the number of reticulocytes is the first sign of improvement after commencement of iron therapy. A reticulocyte value of 5 -10% may be achieved within 2 - 4 weeks, but iron therapy should be continued for an additional 3 – 6 month to replenish iron stores.
- B. Adequate response to supplementation is a return of the hematocrit level half way toward normal within 3 weeks, with full return to baseline after 2 months.
- C. If the client shows no improvement with iron therapy, refer her for physician consultation.
- D. If heavy menstruation appears to be the cause of persistent anemia, an appropriate change in contraceptive method should be considered and referral for gynecologic evaluation, if indicated.

REFERENCES

1. Hatcher RA et al. Contraceptive Technology. 19th Revised Edition. Ardent Media, Inc., New York, 2007
2. Ziemann M , Hatcher RA, et al. A Pocket Guide to Managing Contraception. Bridging the Gap Foundation, Tiger, GA, 2010
3. CDC, Iron Deficiency—United States, 1999-2000, MMWR October 11, 2002, 51 (40):897-899.

APPENDIX A

RELATIONSHIPS BETWEEN IRON STORES AND IRON STUDIES

Progression to Anemia	Iron Studies to Determine Progression
Iron store deficiency ↓	Normal erythropoiesis Decreased serum ferritin (<15 mcg/L)*
Absent stores with Iron-deficient erythropoiesis ↓	Decreased serum iron (<60 mcg/dL); increased TIBC (>360 mcg/dL) Decreased transferrin saturation (<15% typical) Microcytosis/hypochromia
Anemia	Decreased hematocrit/increased RDW Transferrin saturation of <10% Severe erythrocyte changes

Abbreviations: RDW indicates erythrocyte distribution width; TIBC, total iron-binding capacity.

*For postmenopausal women <20 mcg/L is diagnostic. In patients with chronic disease states, the ferritin concentration may rise, but a value of <50 mcg/L is still consistent with iron deficiency and a value of >100 mcg/L excludes it. Iron studies are normal in patients with thalassemia traits α and β .

APPENDIX B

IRON AND VITAMIN C FOOD LIST

Vitamin C-rich foods eaten in the same meal with an iron-rich food will help your body to use the iron.

IRON SOURCES

	Animal Sources	Plants Sources
Excellent	Oysters Liver Kidney	Iron fortified cereals
Very Good	Red meats Turkey Liverwurst	Dried beans Blackstrap molasses
Good	Chicken Crab	Canned plums Apricots, dried Greens (spinach, beets, chard) Enriched breads or pasta Peas
Fair	Egg yolk	Tomato juice, Nuts, Peanut Butter Raisins, Dates, Figs Brussels sprouts, Watermelon

VITAMIN C-RICH FOODS

Best Sources	Good Sources
Broccoli	Cabbage
Brussels sprouts	Cauliflower
Cantaloupe	Collard greens
Grapefruit	Greens, beet or turnip
Grapefruit juice	Potato
Orange	Rutabaga
Orange juice	Spinach
Peppers, red or green	Tangelo or tangerine
Strawberries	Tomato, raw or cooked
	Tomato juice
	V-8 juice