Hemochromatosis Clinical Management

Adults ≥ 18 years of age & ≥ 100 lbs

Sample Phlebotomy Order:

"Phlebotomize 500 cc once a week** if Hgb is ≥ 12.5g/dL"
(Approximate hematocrit of 38%)
**period of time should reflect frequency desired

Clinical Features of Patients with Hemochromatosis

There is a broad spectrum of features, ranging from total lack of symptoms to advanced liver, heart, joint or endocrine disease.

Following is a list of possible ways of identifying hemochromatosis in the asymptomatic patient:

- Abnormal serum iron studies on routine screening chemistry panel
- Evaluation of abnormal liver tests
- Identified by family screening
- Identified by population screening

Non-specific, systemic symptoms or complaints by the patient:

Weakness · Fatigue · Lethargy
Apathy · Weight loss

Specific Organ-related symptoms or diseases:

- Abdominal pain secondary to hepatomegaly
- Arthralgias (...especially reports of pain in the 2nd and 3rd metacarpophalangeal joints)
- Diabetes
- Amenorrhea
- Loss of libido, impotence
- Congestive heart failure, arrhythmias

Signs in the asymptomatic patient:

- Hepatomegaly

Signs in the symptomatic patient by system:

- Liver/Spleen/Gastrointestinal
  - Hepatomegaly
  - Cutaneous stigmata of chronic liver disease
  - Splenomegaly
  - Portal hypertension
  - Ascites
  - Esophageal varices
- Brain
  - Encephalopathy
- Bone & Joint disease
  - Arthritis (especially 2nd and 3rd metacarpophalangeal joints, knees, shoulders, and wrists)
  - Joint swelling
  - Osteoporosis
- Heart
  - Dilated cardiomyopathy
  - Congestive heart failure
- Skin
  - Increased pigmentation (bronze, ashen-gray)
- Endocrine
  - Testicular atrophy
  - Hypogonadism
  - Hypothyroidism

Adapted with permission: Journal of Hepatology
Source: Harrison, S.A, B. R. Bacon. Hereditary hemochromatosis: Update for 2003. Journal of Hepatology 38 (2003): S14-S23.

Genetics: Each person inherits two copies of *HFe*, the candidate gene for classic hemochromatosis. Testing for three mutations is commercially available (C282Y, H63D and S65C). Homozygosity (two copies) for C282Y is most likely to be associated with iron overload. Patients with other *HFe* combinations may be monitored periodically for possible iron loading.

Iron Disorders Institute
Advancing cures for Iron-Out-of-Balance ™

Management of Phlebotomy Therapy

	induction	maintenance
Frequency (in weeks)	*1-2*	*8-20*
Threshold for bleed *fingerstick hemoglobin (Hgb) (g/dL)*	*12.5**	*12.5*
Target values —serum ferritin (ng/mL)	*50-75*	*50-150*
—TS% (transferrin-iron saturation percentage)	*<40%***	*<40%***

***Monitor** serum ferritin (SF) and TS% monthly until SF is <200 ng/mL*
Thereafter, monitor SF and TS% every two bleeds until SF is 75 ng/mL
**12.5g/dL for the majority of cases. Exceptions can include women or patients with liver disease.*
***TS% is normally 25-35%*
IMPORTANT NOTE: It is no longer necessary to produce iron deficiency with or without anemia in patients with hemochromatosis. Otherwise a condition called "Iron Avidity" may occur.
For iron avid patients (high TS% with normal or low normal SF), postpone phlebotomy until iron balance is restored. Some iron avid patients may require therapy to address iron deficiency.

Important Ferritin Reference Ranges

ferritin	Adult Males	Adult Females
Ideal Range	50-150 ng/mL	50-150 ng/mL
Induction Phase*	50-75 ng/mL	50-75 ng/mL

*Serum ferritin decreases ~30ng/mL per 500cc phlebotomy***

Adolescents, Juveniles, Infants & Newborns
of normal height and weight for their age and gender

Male ages 10-19 23-70 ng/mL	Infants 7-12 months 60-80 ng/mL
Female ages 10-19 6-40 ng/mL	Newborn 1-6 months 6-410 ng/mL
Children ages 6-9 10-55 ng/mL	Newborn 1-30 days 6-400 ng/mL
Children ages 1-5 6-24 ng/mL	

*Induction applies only to patients with ihemochromatosis undergoing therapeutic phlebotomy—**Harrison, S.A, B. R. Bacon. Hereditary hemochromatosis: Update for 2003. Journal of Hepatology 38 (2003): S14-S23.*

Diet: *reduce consumption of red meat and while iron levels are elevated: avoid alcohol, raw shellfish and supplemental vitamin C at mealtime.*

Comparing disorders of iron

iron panel	IRON PANEL TESTS					
	Serum Iron	Serum Ferritin	Transferrin Iron Saturation Percentage	Total Iron Binding Capacity (TIBC)	Transferrin	Hemoglobin
Hemochromatosis	↑	↑	↑	↓	↓	NORMAL
Iron Deficiency Anemia	↓	↓	↓	↑	↑	↓
Sideroblastic Anemia	↑	↑	↑	↓	↓	↓
Thalassemia	↑	↑	↑	↓	↓	↓
Porphyria Cutanea Tarda (PCT)	↑	↑	↑	↓	↓	NORMAL
Anemia of Chronic Disease (ACD)	↓	↑ OR NORMAL	↓	↓	↓	↓
African Siderosis (AS)	↑	↑	↑	↓	↓	NORMAL
Vitamin B12 Deficiency (pernicious anemia)	↑ OR NORMAL	↑ OR NORMAL	↑ OR NORMAL	↓ OR NORMAL	↓ OR NORMAL	↓

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