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IRON

- Iron is needed to produce hemoglobin, a type of protein found in red blood cells that has the role of carrying oxygen from your lungs and transporting it throughout your body to your cells
- Needed for general well-being, energy, and a healthy metabolism
- Helps us with digestion and absorption
- 3-4 grams of elemental iron is present in the form of hemoglobin and the rest is stored in the liver, spleen, and bone marrow

IRON LEVELS ON HTMA

- According to my mentor, Dr. Karen, iron levels on HTMA tell you about circulating iron in the blood
- You can have high ferritin levels and low circulating iron, for example
- Iron levels on HTMA are not a reliable indicator of iron deficiency
 - You must check blood chemistry markets to determine this
- Elevated iron on HTMA can be caused by the following:
 - **Primary:** Elevated iron in drinking water
 - You will often see elevated iron with elevated manganese if high iron is caused by drinking water
 - Very common to see this pattern when the client is drinking well-water
 - Brown deposits on the bathtub? If yes, iron is present in water
 - Spending time in a hot tub?
 - **Secondary:** Dental infections
 - If chronic refer to a holistic dentist for a thermography scan
 - Typically will be a bacterial infection present
 - Ferritin will be slightly elevated with elevated HTMA iron (50-75 is what we consider normal for ferritin)
 - Some practitioners, for example, believe ferritin should be as low as possible. I don't agree with this.
 - Kidney infection is possible
 - Bacterial infection in the kidneys
 - Possible abscess
 - Heart infection is possible
 - Bacterial collections around the heart valves
 - Loss of iron is possible



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- If this is extreme, it may indicate cancer
- Start by checking for iron exposure from water. Remove source if present. Filter water with a [Pure Effects Water Filter](#)
 - If iron is chronically high with slightly elevated ferritin - refer to Holistic Dentist and/or MD to check kidneys and heart function

HOW TO ASSESS FOR IRON DEFICIENCY

- Serum iron will be low (<85ug/dL)
- Iron saturation will be low (<25%)
- Ferritin will be low (<50ng/mL) ~ 75 is considered optimal
- TIBC, Transferrin will increase

EARLY STAGE IRON DEFICIENCY

- Ferritin will be low or trending low
- Other markers will be within range
- Slow loss of storage form of iron before serum iron begins to drop

IRON DEFICIENCY SYMPTOMS

- Chronic fatigue
- Low energy
- Pale or yellowing of the skin
- Shortness of breath
- Abnormal heartbeats
- Poor sleep
- Muscle weakness
- Changes in weight
- Trouble concentrating and remembering things
- Dizziness
- Brittle nails
- Headaches
- Weakened immune system
- Leaky gut

THOSE AT RISK FOR IRON DEFICIENCY

- Women with heavy bleeding



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- Pregnant women
- People with poor diets
- People with poor digestion
- People who donate blood frequently
- Cancer patients
- People with GI disorders
- Vegans

CAUSES OF IRON DEFICIENCY

- **Primary:** Poor digestion, low stomach acid, blood loss (heavy periods, postpartum), Blastocystis Hominis
- **Secondary:** Lack of cofactors (Copper, B12, B6, Vitamin C, folate), Calcium excess or calcium shell, metal toxicity (mercury, lead, gadolinium)
- **Tertiary:** Lack of iron in diet, Molybdenum deficiency (interferes with copper, which interferes with iron), titanium toxicity

STRATEGIES FOR IRON DEFICIENCY

- Improve digestion (always start here!)
- Improve nutrition
 - Heme iron (animal foods) is more absorbable than non-heme iron
 - High sources of iron: Beef, sardines, lamb, duck
- Address Blastocystis Hominis infection with antiparasitics (if present)
- Fix low stomach acid
 - GI disorders, stress, zinc deficiency, sodium deficiency, slow oxidation, SIBO, H.pylori, alcohol consumption, SAD all negatively impact stomach acid production
- Address heavy periods
 - Estrogen dominance, progesterone deficiency
 - Fibroids, endometriosis (implement iodine therapy)
 - Xenoestrogens, metalloestrogens
- Address excess calcium (optimal ratio Ca/Fe = 15, high ratio can indicate calcium interference)
- Supplement or increase foods with iron cofactors
 - Red raspberry leaf capsules
- Oral iron is not well-tolerated, transdermal iron patches are better (Recommended: PatchMD)



IRON OVERLOAD

- Typically due to excess iron exposure or chronic inflammation

HOW TO ASSESS FOR IRON OVERLOAD

- Serum iron high
- Iron saturation is high
- TIBC low or normal
- ferritin high or normal
- HTMA iron may be high

IRON OVERLOAD SYMPTOMS

- Obesity
- Diabetes
- Chronic infection
- Osteoporosis (too much damages the bones, but symptoms don't occur until dangerous levels)
- Aches and pains
- Loss of menstruation
- Cancer
- Diarrhea
- Dehydration
- Fatigue
- Heart disease
- High blood pressure
- Insomnia
- Irritability
- Kidney problems
- Vomiting
- Personality/mood disorders
- Deposits in heart, brain, liver, pancreas, joints

MINERAL INTERACTIONS

- Raises sodium



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- Depletes B6
- Depletes Vitamin C
- Depletes manganese, zinc, copper
- Exhausts the adrenal glands (leading to low sodium, magnesium loss)

HOW TO USE BLOOD CHEMISTRY TO ASSESS FOR PERPETUAL INFLAMMATION

- C-Reactive Protein (CRP) - slightly elevated >1.5mg/L
- High fibrinogen >315
- Monocytes >7% (chronic inflammatory marker)
- CO2 (trending low)
- Platelets >225
- Leukocytes >6.5 (indicates high viral load)
- Neutrophils >60% (indicates high bacterial load)
 - This may drop low after body wears down
- High ferritin >100
- Possible low serum iron (but may be normal)
- Normal iron saturation
- TIBC (depends on liver health. If liver is stressed, then this may be low)

PEOPLE AT RISK

- Men
- Post-menopausal women
- High iron in drinking water
- People eating SAD (enriched flours, not usable for iron)

STRATEGIES FOR IRON OVERLOAD

- Avoid Vitamin C supplementation above 500mg per day
- Address B6 deficiency
- Address chronic inflammation
- Address infections
- Infrared sauna
- Filter water
- Avoid high iron foods
- Quercetin, curcumin, Green tea for iron chelation



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- Liver Support
- ALA
- Pectasol-C
- Mineral balancing

WHEN INFECTION IS DRIVING IRON ISSUES (Infection-induced anemia)

- Low serum iron
- Elevated ferritin
- May indicate that the body is sequestering iron away from the infection
- The solution is to address infection NOT to supplement with iron

COPPER & IRON

- If copper is toxic/high - causes viral infections because it pushes iron too low
- If copper is deficient - causes bacterial infections because it pushes iron too high
- If a copper issue is present, this will need to be addressed before iron dysregulation will normalize