BECAUSE IRON DEFICIENCY ANEMIA MATTERS FOR YOUR PATIENTS

Learn about iron deficiency anemia in patients with heart failure.
Iron is an important element in the body.

Iron has a role in a number of different functions throughout the body.¹

Iron is essential to the process of energy production in the mitochondria.²,³

Iron plays an important role in maintaining the oxygen-carrying capacity of blood.¹

Iron deficiency can progress to iron deficiency anemia (IDA).

Iron deficiency is the most common cause of anemia. The progression from iron deficiency to IDA occurs in stages over time.⁴

- Iron intake is unable to keep up with iron required by the body.
- Bone marrow iron stores begin to deplete over time.
- Dietary iron absorption increases to compensate for decreasing iron stores.
- Iron deficiency impairs red blood cell synthesis, leading to anemia.

In some cases, anemia can also progress to IDA. Routinely monitor your patients for IDA.
Certain comorbid conditions may increase the risk of IDA

The etiology of IDA can be multifactorial and coexist with a variety of underlying conditions.\textsuperscript{4-6}

Cardiac patients with HF may have risk factors for iron deficiency

Patients with heart failure may be at further risk of iron deficiency due to a variety of factors.\textsuperscript{7-9}

- Proteinuria from chronic renal disease
- Bleeding due to antiplatelet or anticoagulation medication
- Gastrointestinal bleeding
- Malabsorption
- Inflammation
- Poor nutrition

If you recognize these risk factors in your patients, consider testing for IDA.
Many patients with chronic heart failure (CHF) may also have iron deficiency and anemia. In an international pooled cohort of 1506 patients, 17% of patients with CHF also had IDA.10

<table>
<thead>
<tr>
<th>Condition</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No iron deficiency and no anemia</td>
<td>33% (n=492)</td>
</tr>
<tr>
<td>Iron deficiency and no anemia</td>
<td>17% (n=261)</td>
</tr>
<tr>
<td>Anemia and no iron deficiency</td>
<td>11% (n=164)</td>
</tr>
<tr>
<td>Iron deficiency and anemia</td>
<td>39% (n=589)</td>
</tr>
</tbody>
</table>

In the same study, the incidence of iron deficiency and anemia was greater among patients with more severe New York Heart Association (NYHA) functional class.10*

*Data were captured from a single measurement in time, and the effects of changes in iron, anemia, or NYHA functional class status over time should not be inferred.10

†NYHA IV functional class is defined as being unable to perform any physical activity without discomfort, and having symptoms of chronic HF present at rest.11

‡Patients with both iron deficiency and anemia were older and had a higher NYHA functional class, more comorbidities, and higher biomarker levels compared with those with no iron deficiency and no anemia.11
Anemia and HF share many signs and symptoms, which can mean that anemia may go unnoticed. Both conditions impair oxygen delivery and can lead to a similar array of clinical manifestations.

Testing your patients for IDA can help prevent confusing the symptoms of the two conditions.

### Signs and symptoms of anemia and HF

Anemia and HF share many signs and symptoms, which can mean that anemia may go unnoticed. Both conditions impair oxygen delivery and can lead to a similar array of clinical manifestations.

- Dyspnea
- Edema
- Fatigue
- Cognitive impairment
- Angina pectoris
- Arrhythmia

*Symptoms due to impaired oxygen delivery do not appear in any particular order.
†Some patients may not show symptoms of anemia or HF.

### Diagnosing IDA through blood tests

Although IDA can be hard to spot in patients with HF, a routine blood panel and tests for ferritin, transferrin saturation (TSAT), and hemoglobin levels can help you determine if a patient has IDA.

<table>
<thead>
<tr>
<th>Ferritin</th>
<th>TSAT</th>
<th>Hemoglobin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Iron Deficiency</td>
<td>Iron Deficiency Anemia</td>
</tr>
</tbody>
</table>

Factors to consider when determining if your patient has IDA:

- Is your patient's hemoglobin level low?
- If so, are your patient's TSAT and ferritin levels also low?

If the above assessments are both true, consider a plan for iron replacement, which may include referring your patient to a hematologist-oncologist.
CHF patients with IDA may have increased risk

In a prospective observation study of 157 patients with CHF, the risk of death was 4x as high in patients with IDA as those who were iron replete and without anemia.20*

Study was observational; causal links, therefore, between variables cannot be established.

*Based on a prospective assessment of clinical and iron indexes in 157 consecutively eligible patients with CHF at dedicated HF clinics, at 2 UK hospitals, and 22 control subjects with no known medical conditions or regular medications. CHF was defined based on a >6-month history of appropriate symptoms and signs and a left ventricular ejection fraction of <45%. Anemia was defined as hemoglobin (Hb) <13 g/dL in men and <12 g/dL in women, and iron deficiency was principally defined as TSAT <20%.20

Defining goals for IDA treatment

The optimal outcome of treatment for IDA is iron repletion above the lower threshold of normal.21

**Risk of mortality**

<table>
<thead>
<tr>
<th>No IDA, iron replete (TSAT ≥20%)</th>
<th>IDA, (TSAT &lt;20%) [95% CI, 1.5-10.8]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard ratio 1.0</td>
<td>4.1 (P&lt;0.01)</td>
</tr>
</tbody>
</table>

Achieve iron repletion

- **Increase TSAT**
  - Normal levels: 20% to 50%
  - Normal levels: 40-300 µg/L (male)
  - Normal levels: 20-200 µg/L (female)

- **Increase serum ferritin**
  - Normal levels: 13.5-17.5 g/dL (male)
  - Normal levels: 12.0-15.5 g/dL (female)

- **Increase Hb**
  - Normal levels: 13.5-17.5 g/dL (male)
  - Normal levels: 12.0-15.5 g/dL (female)
Considering **IDA treatment options for your patients**

There are 2 predominant treatment options for patients diagnosed with IDA.

**Oral iron is considered first-line therapy for IDA.**

- Easily accessible at a pharmacy
- Usually dosed 1 to 3 times per day
- The adherence rate of oral iron therapy is estimated to be 40% to 60%

**Oral iron may fail for a number of reasons.**

- Based on maximum duodenal absorption, oftentimes, less than 10% of oral iron is absorbed into the body.
- Some common side effects of oral iron include epigastric discomfort, nausea, vomiting, diarrhea, and constipation.

**For patients on oral iron, continue to monitor their iron levels to determine if treatment is working appropriately.**

**IV iron may be an option if oral iron fails.**

- 100% of intravenous (IV) iron is delivered into the bloodstream
- Some common side effects of IV iron include nausea, hypertension, injection site reactions, hypotension, and headache. Serious hypersensitivity reactions can occur.
- Dextran-free IV iron formulations are available
- IV iron may only be administered in a doctor’s office or an infusion center

**Always consider your patients’ individual treatment needs before prescribing an iron therapy.**

*Less than 10% absorption of oral iron is based on a regimen of 300-mg or 320-mg tablets 3-4 times a day.

---

### References

If your patient with heart failure (HF) is showing signs of iron deficiency anemia (IDA), it is important to remember:

- Some studies have shown that iron deficiency and anemia can be found in 17% of patients with CHF.¹⁰
- IDA and HF may present similar symptoms, so it is important to monitor for both conditions.¹²⁻¹⁷
- Continue to follow up with patients to ensure that their iron replacement plan is appropriate.

Routinely monitor your patients with heart failure for IDA.