Preoperative Hemoglobin Optimization and Anemia Management

Risk Factors for Transfusion: Hemoglobin (Hb) less than (<) 130 g/L, weight less than 65 Kg, elderly, female, complex or repeat surgical procedure, renal insufficiency (creatinine clearance <40 ml/min), antiplatelet agents, anticoagulants, some supplements

Interventions must take into consideration age, gender, anticipated surgical blood loss and pre-existing medical conditions.

A pre and post treatment Hb should ALWAYS be obtained; if still anemic, consider further dosing.

**When assessing a pre-op patient, do a CBC. If anemic, do a ferritin, TSAT and C-reactive protein (CRP) if at all possible.**

<table>
<thead>
<tr>
<th>Hb &lt; 130 g/L (in men &amp; women)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hb &lt; 100 g/L</strong></td>
</tr>
<tr>
<td>Consider delaying procedure Investigate Refer</td>
</tr>
<tr>
<td><strong>Hb 100 – 130 g/L</strong></td>
</tr>
<tr>
<td>Evaluate: for blood loss (GI, menstrual, recurrent epistaxis) anticoagulant status, renal/hepatic failure, infection/inflammation. Refer to appropriate physician for investigation to treat underlying cause if able. Check: CBC, reticulocyte count, Ferritin*, Iron indices, C-reactive protein. Creatinine, Serum B12, Folate testing may be helpful * False elevations may occur with inflammation, infection, chronic disease</td>
</tr>
<tr>
<td><strong>Hb &gt; 130 g/L</strong></td>
</tr>
<tr>
<td>Evaluate surgical procedure needs Consider erythropoietic support if excessive blood loss expected</td>
</tr>
</tbody>
</table>

- **Microcytic (MCV < 80)**
  - consider: iron deficiency, thalassemia, anemia of chronic disease
  - TSAT < .20 (20%) Ferritin < 30 mcg/L
  - Iron deficient (Iron: po if > 8 weeks; IV if < 6 weeks)

- **Normocytic (MCV 80-100)**
  - consider: anemia of chronic disease, renal insufficiency, hemolysis, primary bone marrow disorder.
  - TSAT < .20 (20%) Ferritin 30-100 mcg/L or CRP > 5 mg/L
  - Anemia of chronic disease plus iron deficiency (ESA + iron)

- **Macrocytic (MCV >100)**
  - consider: B12/folate deficiency, reticulocytosis, alcohol, medications.
  - If relevant deficiency:
    - Folic acid 5 mg po daily
    - B12 1000-2000 mcg po daily or IM 1000 mcg weekly x 4 then 500 mcg monthly
  - TSAT low Ferritin > 100 mcg/L or CRP > 5 mg/L
  - Anemia of chronic disease (ESA ± iron)

**Oral iron:** 100 – 200 mg elemental iron by mouth per day. **Note:** alternate day therapy may be beneficial.

Check CBC & ferritin at 4 weeks prior to surgery and if still anemic, give IV iron. For iron-deficient patients in particular, ensure appropriate follow-up.

**IV iron infusion:** if oral iron contraindicated or short time to surgery (<6 weeks). Usual dose 1000 mg, if still anemic consider another 300-500 mg.

**Erythropoietin:** Usual target is Hb 130 g/L. **MAXIMUM target** in renal and oncology patients to less than 120 g/L. Patients with pre-existing thrombotic events should be monitored closely.

- **Standard Dosing:** Epoetin Alfa 20 – 40,000 units subcutaneously (600 units/kg) weekly to a maximum of 4 doses depending on presenting hemoglobin and time to surgery.
- **Short dosing schedule is available for urgent cases:** e.g. 300 IU/kg given for 10 consecutive days prior to surgery, on the day of surgery, and for four days immediately thereafter, or even one day prep/same day/postop.
- **Similarly for IV iron shorter schedules can be useful e.g. day of surgery**

**May be accessed in Ontario through third party provider of the Ontario Drug benefits Plan (Exceptional Access Program), Trillium**

www.ontracprogram.com