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.

Hb < 130 g/L (in men & women)

Hb < 100 g/L

Consider delaying procedure

Investigate

Refer

Hb 100 – 130 g/L

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 B_{12}, Folate testing may be helpful

*** False elevations may occur with inflammation, infection, chronic disease**

Hb > 130 g/L

Evaluate surgical procedure needs

Consider erythropoietic support if excessive blood loss expected

Microcytic (MCV < 80)

consider: iron deficiency, thalassemia, anemia of chronic disease

Normocytic (MCV 80-100)

consider: anemia of chronic disease, renal insufficiency, hemolysis, primary bone marrow disorder.

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 < .20 (20%)
Ferritin < 30 mcg/L

→ **Iron deficient**
(Iron: po if > 8 weeks; IV if < 6 weeks)

TSAT < .20 (20%)
Ferritin 30-100 mcg/L
or CRP > 5 mg/L

→ **Anemia of chronic disease plus iron deficiency**
(ESA + iron)

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 preop/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**

ONTraC Ontario Transfusion Coordinators

www.ontracprogram.com

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(Algorithm developed by the ONTraC coordinators funded by the Ministry of Health of Ontario: 2007. Revised 2012 2013, 2016, 2021)