APPROVED DOCUMENT

Ministry of Health

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Guideline for Management of Iron Deficiency Anemia in Antenatal, Postnatal Women & Pre-operative Gyn patients
MoH/DGKH/OB&GYN/GUD/011/Vers.01 JULY 2023

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Table of content:

Acronyms

CBC	Complete Blood Count
Hb	Hemoglobin
IDA	Iron Ddeficiency Anemia
PPH	Postpartum Hemorrhage
PRBC	Packed Red blood cells
MOH	Ministry of Health
RFT	Renal Function Test
LFT	Liver Function Test
G6PD	Glucose -6-phosphate dehydrogenase
WO& BG	Wattayah Obstetrics and Gynecology clinic
KH	Khoula Hospital
GI	Gastrointestinal

Definition:

Anemia is a condition in which the body does not have enough healthy red blood cells.

In Antenatal, Postnatal Women & Pre-operative Gyn patients it indicates anemia if:

- Hb <11gm% and HCT 33% in 1st trimester.
- Hb <10.5gm % and HCT 32 % in 2nd trimester
- Hb <11gm % and HCT 33% in 3rd trimester
- Hb < 10 gm % postpartum

Guidelines for the Management of Iron Deficiency Anaemia in Antenatal,

Pre-operative and Postnatal Gynaecology Patients

Chapter 1

1. Introduction:

Anemia is a common problem in Obstetrics & perinatal Care. Any Hemoglobin below 10.5% gm can be regarded as true anemia regardless of gestational age. 30-50% of this anemia is due to iron deficiency. Anemia in pregnancy is associated with increased rates of severe maternal morbidity and adverse neonatal outcomes. Therefore, identification and treatment of anemia in pregnancy are of paramount importance and they may serve as a preventive measure for seemingly distinct causes of severe maternal and neonatal morbidity**.** In patients undergoing surgery, preoperative anemia should be identified, evaluated, and managed to minimize red cell transfusion.

2 . Purpose:

The purposes of these guidelines are to:

2.1 Standardize framework for investigation and the management of anemia in Antenatal, postnatal women and gynae patients especially those planned for surgery.

2.2 Provide a guidance for health professionals in determining the appropriate formulation &dosage of parenteral iron therapy for women who have been diagnosed to have iron deficiency anemia.

3. Scope:

These guidelines apply to all health care professionals working in the maternity department and outpatient clinic (OPD) (Wattayah Polyclinic).

Chapter 2

4. Structure

Oral iron therapy is the first line of treatment in IDA. Patients not responding to oral iron therapy, non-compliant, &who are unable to tolerate iron are offered parenteral iron therapy. In the First trimester Iron rich food is recommended. Parenteral iron is offered in the second and third trimester of pregnancy and postpartum period for the rapid restoration of Hb to normal level. **See appendix 1.**

5. Methods and Procedure

5.1 Diagnosis of anemia

5.1.1 Hemoglobin should be checked at :

a. Antenatal booking
b. 26-28wks
c. 36-38wks
d. 2wks postnatal & 6wks postnatal

5.1.2 Anemia profile test will be requested for following:

a. When Hemoglobin concentration is less than 10gms at any time during pregnancy.
b. Previous history of anemia before pregnancy with sickling positive results.

5.1.3 A recent hemoglobin result should be obtained before asking for anemia profile test. Anemia profile tests include:

a. CBC
b. Serum Ferritin
c. Serum Iron Total Iron Binding capacity (if serum ferritin is normal)
d. Hb Electrophoresis
e. G6PD
f. Vitamin B12
g. Serum Folate

5.1.5 Serum ferritin is the most readily available and useful measure of iron deficiency.

5.1.6 Ferritin is an acute phase protein and is elevated in some cases such as inflammation, infection, liver disease and malignancy.

5.1.7 In these cases iron deficiency may be present despite an elevated ferritin.

5.1.8 If Ferritin levels below 15 µg/l are diagnostic of established iron deficiency in all women, however, a level below 30 µg/l in pregnancy should prompt treatment.

5.2. Treatment

5.2.1 Oral iron

a. All pregnant women should receive dietary advice.
b. The first line of management should be oral iron, which is an efficient and safe replacement for iron deficiency.
c. In obstetrics should use ferrous sulphate 200 mg once daily (contains 65 mg of elemental iron).
d. Optimal oral iron containing 40-80 mg elemental iron daily is recommended.
e. Commonly reported side effects of iron tablets include constipation, black stools, abdominal discomfort, nausea, and vomiting.
f. Increasing dose gradually or on alternate day dosing reduces GI upset.
g. Multivitamins should not be used for the treatment of iron deficiency as they contain insufficient amounts of elemental iron.

5.2.2 Response to Oral Iron:

Patients should be counselled how to take oral iron supplements correctly. This should be on an empty stomach, 1 hour before meals, with a source of vitamin C such as orange juice to maximize absorption.

a. Recheck CBC in 3-4 weeks to assess response to treatment and ensure compliance and correct administration. Once the Hb is in the normal range (Hb > 10 g/dL), a replacement should continue for 3 months and at least 6 weeks postpartum to replenish iron stores.
c. If there is a poor compliance or no adequate rise in Hb > 2 grams from baseline, then

i. exclude concomitant causes which may be contributing to the anemia, e.g., vitamin B12 or folate deficiency, anemia of chronic disease or hemoglobinopathy.
ii. consider parenteral iron therapy.
iii. consider hematology referral.

5.3 Parenteral iron therapy

a. Intravenous (IV) iron should be avoided in the first trimester of pregnancy due to uncertain fetal effect.
b. It should be considered from the second trimester onwards and during the third trimester in women with confirmed iron deficiency who fail to respond or are intolerant of oral iron.
c. It is also considered as first line treatment in women presenting after 34 weeks gestation with Hb < 10 g/dl and confirmed iron deficiency.
d. Blood transfusion should be avoided in women with Hb > 7 g/dl consider IV iron infusion unless it is contraindicated or a patient is symptomatic, actively bleeding, in labor or admitted for invasive procedure. **See appendix 2 and 3**.
e. Patients with hemoglobinopathies (e.g. thalassemia or sickle cell disease) who are diagnosed with IDA should be reviewed by a hematologist for appropriate management and treatment.
f. Oral iron is not routinely required after IV iron is given if the total iron deficit has been repleted with IV iron.
g. The dose of parenteral iron should be calculated on pre-pregnancy weight, aiming for a target Hb of 10 g/dL, See **Appendix 4**

Chapter 3:

6. Responsibilities

6.1 **The Head of OBS &GYN Department Shall**

6.1.1 Ensure that all the Doctors are aware and adhere to these guidelines.

6.1.2 Conduct regular audit to ensure implementation of these guidelines.

6.2 **Doctors in the Department of OBS &GYN shall:**

6.2.2 Adhere to these guidelines while managing a case of iron deficiency anemia.

6.2.3 Ensure appropriately manage the adverse reactions of parenteral iron.

6.3 The Pharmacist shall:

6.3.1 Discuss with doctors regarding the initiation of IV iron according to Hb level and other laboratory tests based on these guidelines.

6.3.2 Calculate the total dose of IV iron.

6.3.3 Ensure that administration of iron infusion according to these guidelines.

6.3.4 Document the plan and the total dose calculation in patient's file.

6.4. The Head of Hematologists shall:

6.4.1. ensure all hematologists doctors are aware and adhere to these guidelines.

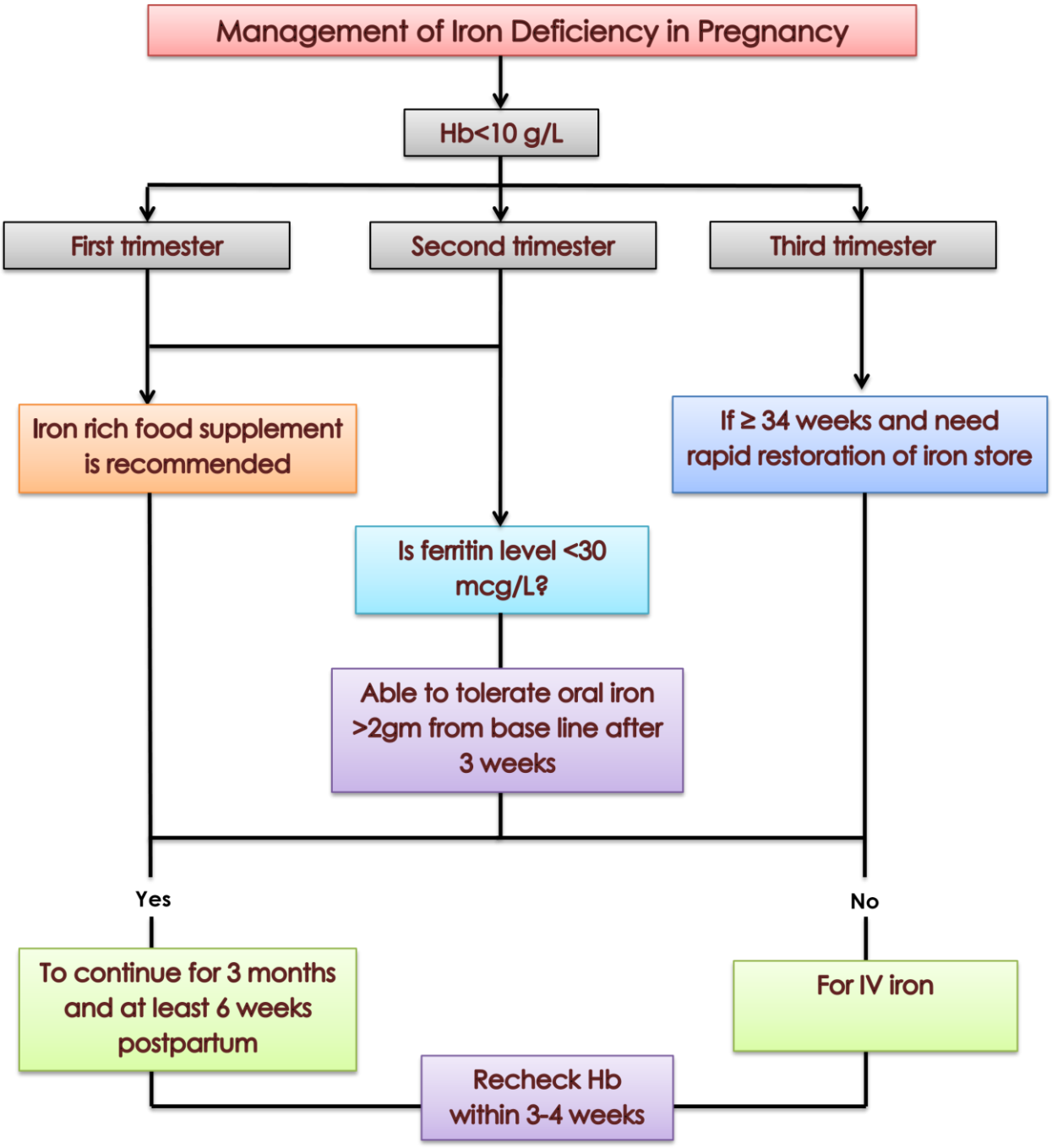
7. Document history and version control table:

Version	Description	Review Date
1	Initial Release	2023

8. **References:**

1. Iron deficiency anemia in pregnancy-OBS&GYNA 8(6)587-596, C. Breymann, 2013
2. AUS/NZJobstgyncol ,2018;58145-147 Invited editorial ,2018
3. Obstetrics –peer reviewed, Iron Deficiency Anemia in Pregnancy and Role
4. of Intravenous Iron, Shravya, Rachel Newman &Richard, July2021
5. Guideline Management of iron deficiency in Maternity &Gynecological patients, Women's The Royal hospital Victoria Australia ,2020
6. Guideline for Management of Iron Deficiency Anemia (IDA) with Parenteral Iron in Adult MOH/DGPHE/GUD, MARCH ,2022
7. UK guidelines on the management of iron deficiency in pregnancy

Appendix 1: IV Iron Replacement chart:

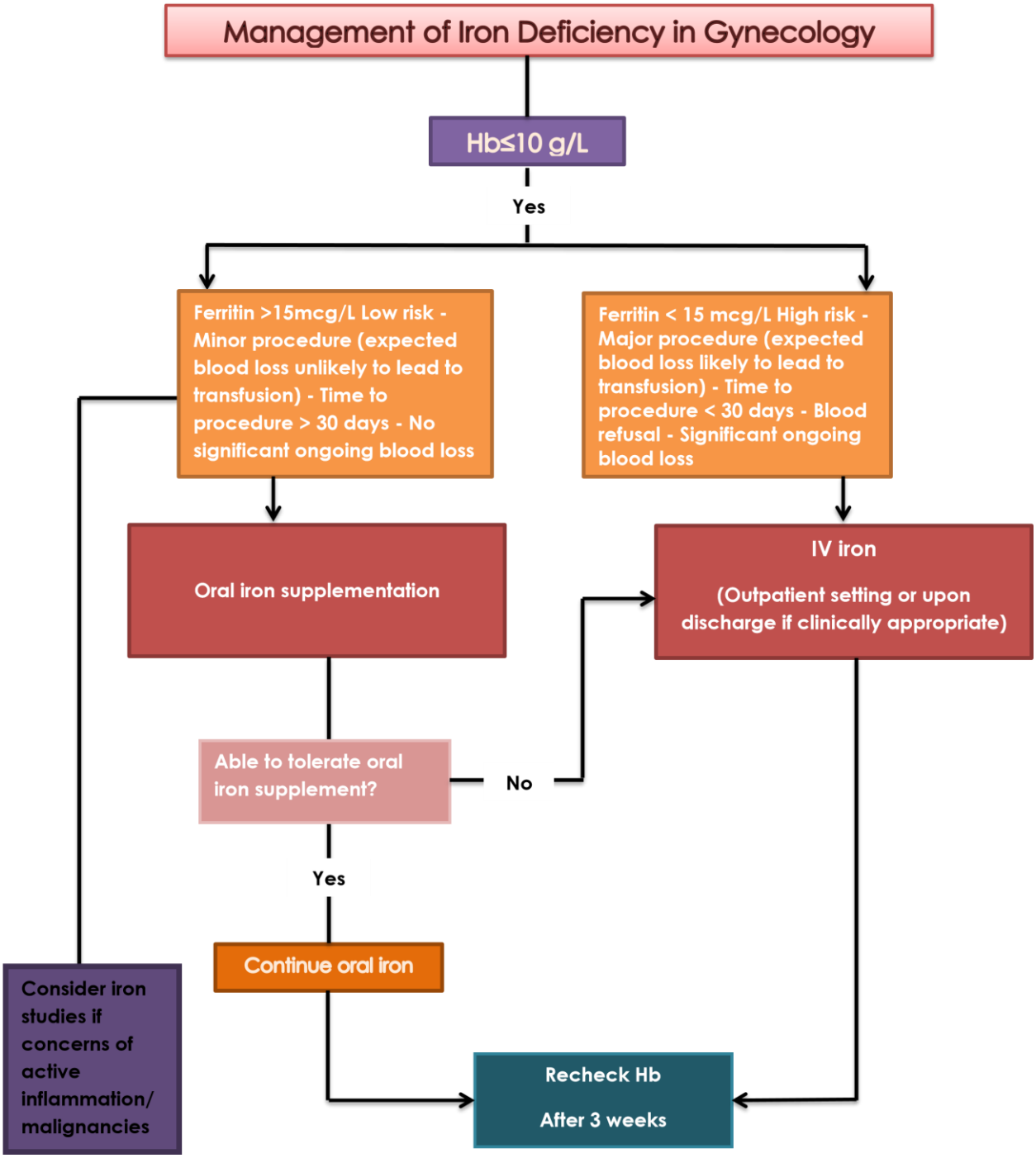


Appendix 2: Management of Postpartum anemia:

CBC	**Action to be Taken.**
Hb < 7 gm/dL	Red cell transfusion should be based on careful evaluation, including whether or not there is risk of bleeding, cardiac compromise or symptoms requiring urgent attention considering oral or parenteral iron therapy as alternatives
Hb 7-10gm/dL	Oral iron if hemodynamically stable, asymptomatic, or mildly symptomatic for at least 3 months IV iron if previously intolerant of or did not respond to oral iron and/or where the severity of symptoms of anaemia requires prompt management

Noted: CBC should be checked within 24-48hrs of delivery in all women, with an estimated blood loss >500ml, and in women with uncorrected anemia in antenatal periods or symptoms suggestive of postpartum anemia

Appendix 3: Management of Iron Deficiency in Gynecology:



Appendix 4. Parenteral Iron Infusion Management:

4.1Iron therapy indication:

Intravenous iron is indicated for the treatment of iron deficiency in the following situations:

- Demonstrate intolerance to oral iron preparations.
- Need to deliver iron rapidly, to replenish iron stores.
- Iron deficiency anemia where oral iron replacement is not indicated or contraindicated due to malabsorption /gastric surgery/active inflammatory bowel disease.
- Non-compliance with oral iron therapy.
- Severe anemia from obstetric hemorrhage.

4.2 Parental Iron Therapy Contraindication:

- Non-Iron deficiency anemia.
- Iron overload/hemochromatosis or risk of iron overload **e.g., sickle cell disease**
- Patients with thalassemia who are diagnosed with iron deficiency **anemia should be reviewed by a hematologist for appropriate management and treatment. Patients with thalassemia or sickle cell disease should NEVER routinely receive iron therapy either oral or intravenous.**
- Previous hypersensitivity to parenteral iron.
- Severe asthma or eczema or atopy.
- Hepatic impairment
- Active infection
- First trimester of pregnancy and in children less than the age of 13.

4.3 Precautions:

- Adverse reactions may be more likely in patients with a history of asthma and /or other allergic conditions.
- Previous adverse reaction to other forms of parenteral iron.

- Liver dysfunction (elevated liver enzymes including lactate dehydrogenase occurs following administration)
- Do not administer to patients currently receiving IV antibiotics for the treatment of acute bacterial infection. IV iron may be considered following cessation of IV antibiotics and is dependent upon the woman's condition.
- Concomitant administration of angiotensin converting enzymes (ACE) inhibitors may increase the incidence of adverse effects of intravenous iron including erythema, abdominal cramps, nausea, vomiting and hypotension.
- Patients with rheumatoid arthritis and other inflammatory diseases may be at particular risk of delayed reaction including fever and reactivation of joint pain.
- Iron sucrose may reduce the absorption of concomitantly administered oral iron preparations. Therefore, oral iron therapy should be started at least 5 days after the last injection of iron sucrose.

4.4 Dose Calculation

The standard method for calculating the total iron deficit is the **Ganzoni Equation**. This formula gives the total iron deficit and dose in mg for restoration of haemoglobin (Hb) & repletion of body iron stores. Round the calculated dose to the nearest 100 mg.

4.4.1 **Dosage of intravenous Iron Sucrose:**

Iron sucrose can be given as a maximum of 200mg not more than 3 times per week; doses must be 24 hours apart. The total cumulative dose of iron sucrose should be calculated using the equation below:

Total body iron deficit in mg = Iron depot + [weight in kg x 0.24 x (target Hb in g/dl – actual Hb in g/dl)]

Or

Total body iron deficit in mg = Iron depot + [weight in kg x 2.4 x (target Hb in g/l – actual Hb in g/l)]

Noted: * vial size is 100mg

* Use pre-pregnancy weight (kg)

4.5 Method of administration and monitoring of parenteral iron:

- Dilute each 100mg elemental iron in 100ml normal saline and infuse over 15 minutes or 200mg elemental iron in 200ml normal saline and infuse over 30 minutes by slow IV infusion.
- The first infusion of Iron sucrose must include a test dose; (facilities for cardiopulmonary resuscitation should be available). 25mg of Iron sucrose should be infused over a period of 15 minutes. If no adverse events occur during the test dose, the remainder of the dose should be given at an infusion rate of not more than 50ml in 15 minutes.
- During infusion vitals to be monitored every 15min.
- Temperature, pulse, respirations, and blood pressure as per normal observations at baseline and at initial 5 minutes, and at the end of the infusion and at 30 minutes post infusion.
- Patients may be discharged 30 minutes post infusion if observations are satisfactory.
- Remove the intravenous cannula prior to discharge.

4.6 Adverse Effects:

- Adverse reactions are rare; however, facilities for dealing with anaphylaxis and cardiopulmonary resuscitation should be available.
- It is recommended that the anaphylaxis box is kept in close vicinity of a patient receiving IV iron.
- The administration is carried out by a health care professional who is IV certified and has attended the Trusts anaphylaxis study day or received training in the management of anaphylaxis.
- Non-serious anaphylactoid reactions occurred rarely.

4.7 Management of Adverse Events

- In the event of a serious anaphylactic or allergic reaction, stop the infusion/ IM adrenaline should be administered and appropriate resuscitation measures initiated.

- Mild allergic reactions should be managed by stopping the infusion and administering antihistamines.
- Hypotensive episodes may occur if administration is too fast, so decrease infusion time as clinically indicated.