

Iron Deficiency in Pregnancy

The most common nutritional deficiency in pregnancy. Maternal hemodilution + fetal iron demand depletes stores, threatening oxygen delivery to mother & fetus. Hgb <11 g/dL (1st & 3rd trimester) or <10.5 g/dL (2nd trimester).

● HEMATOLOGY • 08

01 DEFINITION & OVERVIEW

WHAT IT IS • WHY IT MATTERS

- Most common **hematologic disorder of pregnancy** — affects ~50% of pregnant women globally.
- Diagnostic: **Hgb <11 g/dL** (1st & 3rd trimester), **<10.5 g/dL** (2nd trimester); **Hct <33%**.
- Pregnancy ↑ iron demand to **~1,000 mg total** (fetus, placenta, expanded blood volume, blood loss at delivery).
- Untreated → preterm labor, LBW, IUGR, postpartum hemorrhage, impaired neonatal neurodevelopment.

TRIMESTER CUTOFFS (HGB)

<11

1ST

<10.5

2ND

<11

3RD

Hct cutoffs: **<33%** (1st/3rd) • **<32%** (2nd).

02 PATHOPHYSIOLOGY

MECHANISM

- Pregnancy → **↑ plasma volume 40–50%** > ↑ RBC mass → physiologic hemodilution
- Fetus & placenta demand iron (esp. **3rd trimester**) → maternal stores depleted
- Inadequate iron intake/absorption → **↓ Hgb synthesis**
- RBCs become **microcytic & hypochromic** (small, pale)
- ↓ O₂-carrying capacity → maternal fatigue + **fetal hypoxia risk**

RX RISK FACTORS

WHO'S AT RISK

- Multiple gestation (twins, triplets)
- Closely spaced pregnancies (<2 yrs apart)
- Adolescent pregnancy (still growing)
- Vegetarian / vegan diet (non-heme iron)
- Heavy menses pre-pregnancy
- Low socioeconomic status / food insecurity
- Bariatric surgery hx → malabsorption
- Hyperemesis gravidarum (poor intake)
- Chronic NSAID or PPI use

SCREENING

CBC + ferritin at **1st prenatal visit, 24–28 wks** (with GDM screen), and PRN if symptomatic.

03 SIGNS & SYMPTOMS

EARLY • LATE • RED FLAGS

EARLY / MILD

- Pallor** (skin, conjunctiva, nail beds, palmar creases)
- Fatigue, weakness, lethargy
- Cold intolerance, cool extremities
- Headache, mild dizziness
- Decreased exercise tolerance
- Irritability, poor concentration

LATE / SEVERE — RED FLAGS

- Tachycardia & palpitations** (compensatory)
- Dyspnea on exertion** • resting SOB
- Pica** — craving ice (pagophagia), dirt, starch, clay
- Koilonychia** — spoon-shaped, brittle nails
- Glossitis, angular cheilitis (mouth corners)
- Syncope, restless leg syndrome
- Systolic flow murmur
- Signs of fetal compromise — ↓ FHR variability, IUGR

FERRITIN

<15 ng/mL

Falls FIRST — best early marker

HGB

<11 g/dL

Trimester-dependent

MCV / MCH

↓ both

Microcytic • hypochromic

TIBC

↑ elevated

↓ serum iron • ↓ transferrin sat

04 PRIORITY NURSING INTERVENTIONS

ABCS • SAFETY • PRIORITIZATION

1 ASSESS

Hgb, Hct, ferritin at 1st visit, 24–28 wks; reassess q4–6 wks.

2 MONITOR

VS for tachycardia, hypotension, dyspnea — cardiac strain.

3 ADMINISTER

oral iron 1 hr before / 2 hrs after meals + vitamin C.

4 ASSESS

FHR & fundal height — screen IUGR, hypoxia, ↓ variability.

5 EDUCATE

on dietary iron, vitamin C pairing, avoiding inhibitors.

6 IMPLEMENT

energy conservation — rest periods, cluster care.

7 EVALUATE

GI side effects (constipation) → stool softener PRN.

8 PREPARE

type & screen / cross-match before delivery — PPH risk.

05 PHARMACOLOGY

DRUG • MECHANISM • S/E • NURSING

Oral Iron — Ferrous Sulfate, Gluconate, Fumarate

1ST
LINE

MECHANISM	Replenishes iron stores → restores Hgb synthesis. Ferrous sulfate 325 mg PO daily-TID (65 mg elemental Fe/tab). Prophylactic: 27 mg elemental in prenatal vitamin.
SIDE EFFECTS	Constipation (#1), nausea, GI upset, epigastric pain, dark/tarry stools (NORMAL) , metallic taste, teeth staining (liquid).
NURSING	Take on empty stomach with vitamin C / OJ (↑ absorption). AVOID : milk, calcium, antacids, tea, coffee, eggs, bran (within 2 hrs). Liquid: dilute, use straw, rinse mouth. Stool softener PRN. Hgb rises in 4–6 wks.

Parenteral Iron — Iron Sucrose • Iron Dextran • Ferric Gluconate

2ND
LINE

INDICATION	Severe deficiency, oral intolerance, malabsorption, non-adherence, late pregnancy needing rapid correction.
SIDE EFFECTS	Anaphylaxis (iron dextran), hypotension, flushing, IM site staining, arthralgia.
NURSING	Give test dose first (esp. dextran). IM: Z-track technique , deep gluteal, do NOT massage. IV: slow infusion, monitor VS, have epinephrine + resuscitation ready.

PRBC Transfusion

EMERGENCY

INDICATION	Hgb <7 g/dL , hemodynamic instability, active bleeding, severe sx unresponsive to iron, near delivery.
NURSING	Verify with 2 RNs, baseline VS, monitor q15 min × 1 hr for transfusion reaction (fever, chills, back pain, dyspnea). Type & cross before delivery in severe IDA.

Prenatal Vitamin (Prophylaxis)

ROUTINE

CONTAINS	27 mg elemental iron + 400–800 mcg folic acid + vitamin C + B12 + calcium.
NURSING	Start 3 months pre-conception if possible (neural tube prevention). Continue throughout pregnancy + 6 wks postpartum / lactation.

06 NCLEX TEST TRAPS

COMMON CONFUSIONS

- ! **Dark / tarry stools = NORMAL** with iron — NOT GI bleed (in this context). Don't hold the med.
- ! Take iron with **vitamin C / OJ**, NOT milk, calcium, antacids, coffee, tea.
- ! Liquid iron **stains teeth** → use straw + rinse mouth (don't brush immediately — enamel).
- ! IM iron = **Z-track** always (prevents staining + irritation). NOT standard IM.
- ! Hgb cutoffs **change by trimester**: <11 (1st/3rd) vs <10.5 (2nd).
- ! **Ferritin** is the earliest lab to drop — not Hgb. Pick ferritin in early detection questions.
- ! Don't confuse **physiologic anemia of pregnancy** (dilutional, normal) with TRUE IDA.
- ! Iron is **#1 pediatric poisoning fatality** — store away from children.
- ! Allow **4–6 weeks** before expecting Hgb rise — don't escalate too early.

CX COMPLICATIONS

IF UNTREATED

MATERNAL

- ◆ Preterm labor & preterm birth
- ◆ **Postpartum hemorrhage** (poor uterine contractility)
- ◆ ↑ Infection risk • poor wound healing
- ◆ Cardiac failure (severe IDA)
- ◆ Postpartum depression risk ↑

FETAL / NEONATAL

- ◆ Low birth weight (LBW)
- ◆ Intrauterine growth restriction (IUGR)
- ◆ Preterm birth
- ◆ Neonatal iron deficiency
- ◆ **Impaired neurodevelopment** (cognition, motor)
- ◆ ↑ Perinatal mortality

07 PATIENT EDUCATION

TEACH • REINFORCE • EMPOWER

✓ DO — PROMOTE ABSORPTION

- ◆ Take iron **1 hr before** or **2 hrs after** meals (empty stomach).
- ◆ Pair with **vitamin C** — OJ, strawberries, citrus, tomatoes, peppers.
- ◆ Eat heme iron: red meat, liver, poultry, fish, egg yolks.
- ◆ Non-heme: spinach, lentils, beans, fortified cereals, raisins, prunes.
- ◆ ↑ Fluids (8–10 glasses/day) + **fiber** • use **stool softener** PRN.
- ◆ Continue iron **6 weeks postpartum** to rebuild stores.
- ◆ Store **out of children's reach** — toxic if ingested.

✗ DON'T — BLOCK ABSORPTION

- ◆ Don't take with **milk, dairy, or calcium** supplements (within 2 hrs).
- ◆ Don't take with **antacids**, PPIs, coffee, tea, or cocoa (tannins).
- ◆ Don't take with bran, whole grains, eggs at same time.
- ◆ Don't crush enteric-coated or extended-release tabs.
- ◆ Don't be alarmed by **dark / green-black stools** — expected.
- ◆ Don't stop iron when Hgb normalizes — continue per provider.
- ◆ Don't double-up missed doses.

08 MEMORY BOOSTERS

MNEMONICS • PATTERNS

IRON

ADMINISTRATION RULES

- I** Increase vitamin C intake
- R** Rest periods scheduled
- O** On empty stomach (best)
- N** No milk, calcium, antacids

PALE

HALLMARK SYMPTOMS

- P** Pallor (skin, conjunctiva, nail beds)
- A** Appetite changes (pica — ice, dirt)
- L** Lethargy & fatigue
- E** Exertional dyspnea + tachycardia

SPOON

SEVERE DEFICIENCY CLUES

- S** Spoon-shaped nails (koilonychia)
- P** Pica (ice, dirt, starch)
- O** Oral changes (glossitis, cheilitis)
- O** Overworked heart (tachy, murmur)
- N** Neuropsych (restless legs, irritability)