



## NAVIGATING NOVEL IRON DEFICIENCY ANEMIA MANAGEMENT STRATEGIES IN WOMEN'S HEALTH:

An Animated Whiteboard Tour of Intravenous Iron for the OB/GYN



### Bibliography

ACOG Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. *Obstet Gynecol*. 2017;130(4):e168-e186.

ACOG Committee on Practice Bulletins—Obstetrics. Anemia in Pregnancy: ACOG Practice Bulletin, Number 233. *Obstet Gynecol*. 2021;138(2):e55-e64.

Anand IS, Gupta P. Anemia and Iron Deficiency in Heart Failure: Current Concepts and Emerging Therapies. *Circulation*. 2018;138(1):80-98.

Auerbach M, Gafter-Gvili A, Macdougall IC. Intravenous iron: a framework for changing the management of iron deficiency. *Lancet Haematol*. 2020;7(4):e342-e350.

Avni T, Bieber A, Grossman A, et al. The safety of intravenous iron preparations: systematic review and meta-analysis. *Mayo Clin Proc*. 2015;90:12-23.

Benson CS, Shah A, Stanworth SJ, et al. The effect of iron deficiency and anaemia on women's health. *Anaesthesia*. 2021;76 Suppl 4:84-95.

Breymann C, Milman N, Mezzacasa A, et al; FER-ASAP investigators. Ferric carboxymaltose vs. oral iron in the treatment of pregnant women with iron deficiency anemia: an international, open-label, randomized controlled trial (FER-ASAP). *J Perinat Med*. 2017;45(4):443-453.



Caimmi S, Crisafulli G, Franceschini F, et al. Hypersensitivity to Intravenous Iron Preparations. *Children (Basel)*. 2022;9(10):1473.

Camaschella C. Iron deficiency [published correction appears in *Blood*. 2023 Feb 9;141(6):682]. *Blood*. 2019;133(1):30-39.

Chodankar R, Harper A, Mahmood T. Heavy menstrual bleeding. *Obstet Gynaecol Reprod Med*. 2018;28(7):196-202.

U.S. National Library of Medicine. ClinicalTrials.gov. Available at: <https://clinicaltrials.gov/>. Accessed June 2023.

Daru J, Zamora J, Fernández-Félix BM, et al. Risk of maternal mortality in women with severe anaemia during pregnancy and postpartum: a multilevel analysis. *Lancet Glob Health*. 2018;6(5):e548-e554.

DeLoughery TG. Safety of oral and intravenous iron. *Acta Haematol* 2019;142:8-12.

DeLoughery TG. Iron deficiency anemia. *Med Clin North Am*. 2017;101:319-332.

Diez Lobo AI, Fisac-Martin MP, Bermejo-Aycar I, et al. Preoperative intravenous iron administration corrects anemia and reduces transfusion requirement in women undergoing abdominal hysterectomy. *Transfus Altern Transfus Med*. 2007;9:114-119.

Drugs@FDA: FDA-Approved Drugs. Ferric carboxymaltose. May 31, 2023. Available at: [https://www.accessdata.fda.gov/drugsatfda\\_docs/label/2023/203565s020lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/203565s020lbl.pdf). Accessed June 2023.

Drugs@FDA: FDA-Approved Drugs. Iron dextran. April 20, 2021. Available at: [https://www.accessdata.fda.gov/drugsatfda\\_docs/label/2021/017441s179lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2021/017441s179lbl.pdf). Accessed June 2023.

Drugs@FDA: FDA-Approved Drugs. Sodium ferric gluconate. February 28, 2012. Accessed June 2023.

Drugs@FDA: FDA-Approved Drugs. Iron sucrose. January 20, 2021. Available at: [https://www.accessdata.fda.gov/drugsatfda\\_docs/label/2021/021135Orig1s037lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2021/021135Orig1s037lbl.pdf). Accessed June 2023.

Drugs@FDA: FDA-Approved Drugs. Ferumoxytol. June 16, 2022. Available at: [https://www.accessdata.fda.gov/drugsatfda\\_docs/label/2022/022180s025lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2022/022180s025lbl.pdf). Accessed June 2023.

Drugs@FDA: FDA-Approved Drugs. Ferric derisomaltose. August 4, 2022. Available at: [https://www.accessdata.fda.gov/drugsatfda\\_docs/label/2022/208171Orig1s002lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2022/208171Orig1s002lbl.pdf). Accessed June 2023.



Fernandez-Jimenez MC, Moreno G, et al. Iron Deficiency in Menstruating Adult Women: Much More than Anemia. *Womens Health Rep (New Rochelle)*. 2020 Jan 29;1(1):26-35.

Fraser IS, Mansour D, Breymann C, et al. Prevalence of heavy menstrual bleeding and experiences of affected women in a European patient survey. *Int J Gynaecol Obstet*. 2015;128(3):196-200.

Frick KD, Clark MA, Steinwachs DM, et al. Financial and quality-of-life burden of dysfunctional uterine bleeding among women agreeing to obtain surgical treatment. *Womens Health Issues*. 2009;19(1):70-78.

Friedman AJ, Chen Z, Ford P, et al. Iron deficiency anemia in women across the life span. *J Womens Health (Larchmt)*. 2012;21(12):1282-1289.

Friedman AJ, Shander A, Martin SR, et al. Iron deficiency anemia in women: a practical guide to detection, diagnosis, and treatment. *Obstet Gynecol Surv*. 2015;70:342-53.

Froessler B, Gajic T, Dekker G, et al. Treatment of iron deficiency and iron deficiency anemia with intravenous ferric carboxymaltose in pregnancy. *Arch Gynecol Obstet*. 2018;298(1):75-82.

Garzon S, Cacciato PM, Certelli C, Salvaggio C, Magliarditi M, Rizzo G. Iron Deficiency Anemia in Pregnancy: Novel Approaches for an Old Problem. *Oman Med J*. 2020;35(5):e166.

Georgieff MK. Iron deficiency in pregnancy. *Am J Obstet Gynecol*. 2020;223(4):516-524.

Govindappagari S, Burwick RM. Treatment of Iron Deficiency Anemia in Pregnancy with Intravenous versus Oral Iron: Systematic Review and Meta-Analysis. *Am J Perinatol*. 2019;36(4):366-376.

Hansen R, Sommer VM, Pinborg A, et al. Intravenous ferric derisomaltose versus oral iron for persistent iron deficient pregnant women: a randomized controlled trial [published online ahead of print, 2022 Sep 15]. *Arch Gynecol Obstet*. 2022.

Jain V, Chodankar RR, Maybin JA, Critchley HOD. Uterine bleeding: how understanding endometrial physiology underpins menstrual health. *Nat Rev Endocrinol*. 2022;18(5):290-308.

Jimenez K, Kulnigg-Dabsch S, Gasche C. Management of Iron Deficiency Anemia. *Gastroenterol Hepatol (N Y)*. 2015;11(4):241-250.

Johnson-Wimbley TD, Graham DY. Diagnosis and management of iron deficiency anemia in the 21st century. *Therap Adv Gastroenterol*. 2011;4(3):177-184.

Kassebaum NJ, Jasrasaria R, Naghavi M, et al. A systematic analysis of global anemia burden from 1990 to 2010. *Blood*. 2014;123(5):615-624.

Kim YH, Chung HH, Kang SB, et al. Safety and usefulness of intravenous iron sucrose in the management of preoperative anemia in patients with menorrhagia: a phase IV, open-label, prospective, randomized study. *Acta Haematol*. 2009;121(1):37-41.



Lee S, Ryu KJ, Lee ES, et al. Comparative efficacy and safety of intravenous ferric carboxymaltose and iron sucrose for the treatment of preoperative anemia in patients with menorrhagia: An open-label, multicenter, randomized study. *J Obstet Gynaecol Res* 2019;45:858-864.

Litton E, Xiao J, Ho KM. Safety and efficacy of intravenous iron therapy in reducing requirement for allogeneic blood transfusion: systematic review and meta-analysis of randomized clinical trials. *BMJ*. 2013;347:f4822.

Lopez A, Cacoub P, Macdougall IC, Peyrin-Biroulet L. Iron deficiency anaemia. *Lancet*. 2016;387(10021):907-916.

Macdougall IC, Vernon K. Complement Activation-Related Pseudo-Allergy: A Fresh Look at Hypersensitivity Reactions to Intravenous Iron. *Am J Nephrol*. 2017;45(1):60-62.

Mansour D, Hofmann A, Gemzell-Danielsson K. A Review of Clinical Guidelines on the Management of Iron Deficiency and Iron-Deficiency Anemia in Women with Heavy Menstrual Bleeding. *Adv Ther*. 2021;38(1):201-225.

Marcewicz LH, Anderson BL, Byams VR, et al. Screening and Treatment for Iron Deficiency Anemia in Women: Results of a Survey of Obstetrician-Gynecologists. *Matern Child Health J*. 2017;21(8):1627-1633.

McDonagh T, Macdougall IC. Iron therapy for the treatment of iron deficiency in chronic heart failure: intravenous or oral?. *Eur J Heart Fail*. 2015;17(3):248-262.

Means RT. Iron Deficiency and Iron Deficiency Anemia: Implications and Impact in Pregnancy, Fetal Development, and Early Childhood Parameters. *Nutrients*. 2020;12(2):447.

Miller JL. Iron deficiency anemia: a common and curable disease. *Cold Spring Harb Perspect Med*. 2013;3(7):a011866.

Milman N. Postpartum anemia I: definition, prevalence, causes, and consequences. *Ann Hematol*. 2011;90(11):1247-1253.

Moretti D, Goede JS, Zeder C, et al. Oral iron supplements increase hepcidin and decrease iron absorption from daily or twice-daily doses in iron-depleted young women. *Blood*. 2015;126(17):1981-1989.

Muñoz M, Acheson AG, Auerbach M, et al. International consensus statement on the peri-operative management of anaemia and iron deficiency. *Anaesthesia*. 2017;72(2):233-247.

Munro MG, Mast AE, Powers JM, et al. The relationship between heavy menstrual bleeding, iron deficiency, and iron deficiency anemia [published online ahead of print, 2023 Jan 24]. *Am J Obstet Gynecol*. 2023;S0002-9378(23)00024-8.



Munro MG, Critchley HOD, Fraser IS; FIGO Menstrual Disorders Committee. The two FIGO systems for normal and abnormal uterine bleeding symptoms and classification of causes of abnormal uterine bleeding in the reproductive years: 2018 revisions [published correction appears in *Int J Gynaecol Obstet.* 2019 Feb;144(2):237]. *Int J Gynaecol Obstet.* 2018;143(3):393-408.

Musallam KM, Tamim HM, Richards T, et al. Preoperative anaemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study. *Lancet.* 2011;378(9800):1396-1407.

Nikravesh N, Borchard G, Hofmann H, et al. Factors influencing safety and efficacy of intravenous iron-carbohydrate nanomedicines: From production to clinical practice. *Nanomedicine.* 2020;26:102178.

Pan American Health Organization (PAHO). Anemia in women and children. Available at: [www.paho.org/anemia-women-and-children](http://www.paho.org/anemia-women-and-children). Accessed June 2023.

Percy L, Mansour D, Fraser I. Iron deficiency and iron deficiency anaemia in women. *Best Pract Res Clin Obstet Gynaecol.* 2017;40:55-67.

Petraglia F, Dolmans MM. Iron deficiency anemia: Impact on women's reproductive health. *Fertil Steril.* 2022;118(4):605-606.

Rampton D, Folkersen J, Fishbane S, et al. Hypersensitivity reactions to intravenous iron: guidance for risk minimization and management. *Haematologica.* 2014;99(11):1671-1676.

Recommendations to prevent and control iron deficiency in the United States. Centers for Disease Control and Prevention. *MMWR Recomm Rep.* 1998;47(RR-3):1-29.

Richards T, Musallam KM, Nassif J, et al. Impact of preoperative anaemia and blood transfusion on postoperative outcomes in gynaecological surgery. *PLoS One.* 2015;10(7):e0130861.

Schmidt C, Allen S, Kopyt N, et al. Iron replacement therapy with oral ferric maltol: review of the evidence and expert opinion. *J Clin Med.* 2021;10(19):4448.

Schoep ME, Nieboer TE, van der Zanden M, et al. The impact of menstrual symptoms on everyday life: a survey among 42,879 women. *Am J Obstet Gynecol.* 2019;220(6):569.e1-569.e7.

Schoep ME, Adang EMM, Maas JWM, De Bie B, Aarts JWM, Nieboer TE. Productivity loss due to menstruation-related symptoms: a nationwide cross-sectional survey among 32 748 women. *BMJ Open.* 2019;9(6):e026186.

Seid MH, Butcher AD, Chatwani A. Ferric Carboxymaltose as Treatment in Women with Iron-Deficiency Anemia. *Anemia.* 2017;2017:9642027.

Siewertsz van Reesema LL, Andrews BC, Gaughan TJ, et al. Preoperative anemia and 30-day postoperative outcomes among women undergoing laparoscopic myomectomy. *Am J Obstet Gynecol.* 2022;226(3):S1323-S1324.



Smith C, Teng F, Branch E, Chu S, Joseph KS. Maternal and Perinatal Morbidity and Mortality Associated With Anemia in Pregnancy. *Obstet Gynecol*. 2019;134(6):1234-1244.

Steveling-Klein EH, Mateluna CM, Meienberg A, et al. Management of Hypersensitivity Reactions to Nondextran Iron Products: New Insights Into Predisposing Risk Factors. *J Allergy Clin Immunol Pract*. 2021;9(6):2406-2414.e2.

Stevens GA, Paciorek CJ, Flores-Urrutia MC, et al. National, regional, and global estimates of anaemia by severity in women and children for 2000-19: a pooled analysis of population-representative data. *Lancet Glob Health*. 2022;10(5):e627-e639.

Strauss WE, Auerbach M. Health-related quality of life in patients with iron deficiency anemia: impact of treatment with intravenous iron. *Patient Relat Outcome Meas*. 2018;9:285-298.

Thakrar SJ, Clevenger B, Mallett S. Patient blood management and perioperative anemia. *BJA Education*. 2017;17(1):28-34.

Tyan P, Taher A, Carey E, et al. Effect of Perioperative Transfusion on Postoperative Morbidity Following Minimally Invasive Hysterectomy for Benign Indications. *J Minim Invasive Gynecol*. 2020;27(1):200-205.

United States Preventive Services Task Force (USPSTF). Iron deficiency anemia in pregnant women: screening and supplementation. Available at:

<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/iron-deficiency-anemia-in-pregnant-women-screening-and-supplementation>. Accessed June 2023.

Van Wyck DB, Mangione A, Morrison J, et al. Large-dose intravenous ferric carboxymaltose injection for iron deficiency anemia in heavy uterine bleeding: a randomized, controlled trial. *Transfusion*. 2009;49(12):2719-2728.

World Health Organization (WHO). Anemia in women and children. 2021. Available at:  
[https://www.who.int/data/gho/data/themes/topics/anaemia\\_in\\_women\\_and\\_children](https://www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children). Accessed June 2023.

World Health Organization (WHO). Hemoglobin concentrations for the diagnosis of anemia and assessment of severity. 2011. Available at:

[https://apps.who.int/iris/bitstream/handle/10665/85839/WHO\\_NMH\\_NHD\\_MNM\\_11.1\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/85839/WHO_NMH_NHD_MNM_11.1_eng.pdf). Accessed June 2023.