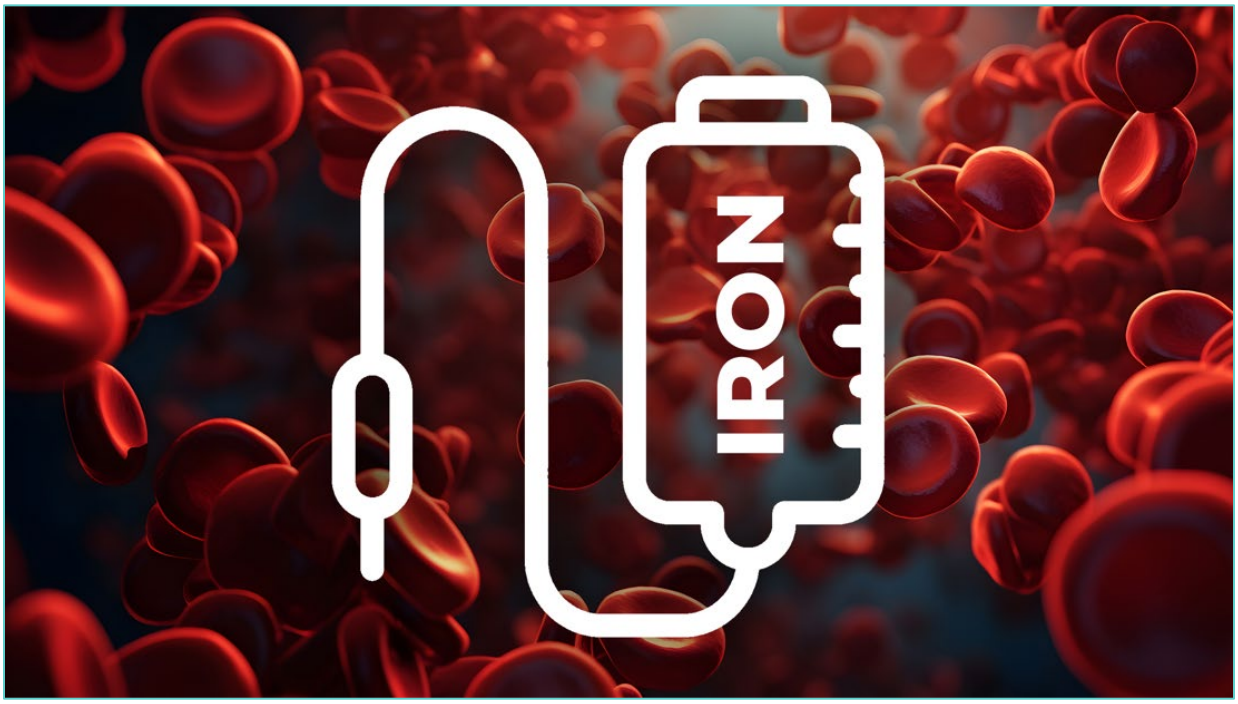
Integrating IV Iron into Cancer Care: An Expert Overview of Best Practices



Bibliography & Suggested Reading

Aapro M, Beguin Y, Bokemeyer C, et al. Management of anaemia and iron deficiency in patients with cancer: ESMO Clinical Practice Guidelines [published correction appears in Ann Oncol. 2018 Oct 1;29(Suppl 4):iv271]. *Ann Oncol*. 2018;29(Suppl 4):iv96-iv110.

Andrews N. Dietary iron of metabolism. *N Engl J Med.* 1999.

Andrews NC. Forging a field: the golden age of iron biology. *Blood*. 2008;112(2):219-230.

Auerbach M, Ballard H, Trout JR, et al. Intravenous iron optimizes the response to recombinant human erythropoietin in cancer patients with chemotherapy-related anemia: a multicenter, open-label, randomized trial. *J Clin Oncol*. 2004;22(7):1301–1307.

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.

Bastit L, Vandebroek A, Altintas S, et al. Randomized, multicenter, controlled trial comparing the efficacy and safety of darbepoetin alpha administered every 3 weeks with or without intravenous iron in patients with chemotherapy-induced anemia. *J Clin Oncol*. 2008;26(10):1611-1618.

Birgegård G, Henry D, Glaspy J, et al. A randomized noninferiority trial of intravenous iron isomaltoside versus oral iron sulfate in patients with nonmyeloid malignancies and anemia receiving chemotherapy: the PROFOUND trial. *Pharmacotherapy*. 2016;36(4):402–414.

Bohlius J, Bohlke K, Castelli R, et al. Management of cancer-associated anemia with erythropoiesis-stimulating agents: ASCO/ASH clinical practice guideline update. *Blood Adv*. 2019;3(8):1197-1210.

Brugnara C, Schiller B, Moran J. Reticulocyte hemoglobin equivalent (Ret He) and assessment of iron-deficient states. *Clin Lab Haematol.* 2006.

Buchrits S, Itzhaki O, Avni T, Raanani P, Gafter-Gvili A. Intravenous Iron Supplementation for the Treatment of Chemotherapy-Induced Anemia: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Clin Med*. 2022;11(14):4156.

Busti F, Marchi G, Ugolini S, et al. Anemia and iron deficiency in cancer patients: role of iron replacement therapy. *Pharmaceuticals (Basel).* 2018;11(4).

Calleja JL, Delgado S, del Val A, et al. Ferric carboxymaltose reduces transfusions and hospital stay in patients with colon cancer and anemia. *Int J Colorectal Dis*. 2016;31(3):543-551.

Camaschella C, Nai A, Silvestri L. Iron metabolism and iron disorders revisited in the hepcidin era. *Haematologica*. 2020;105(2):260–272.

Crawford J, Cella D, Cleeland CS, et al. Relationship between changes in hemoglobin level and quality of life during chemotherapy in anemic cancer patients receiving epoetin alfa therapy. *Cancer*. 2002;95(4):888-895.

D'Angelo G. Role of hepcidin in the pathophysiology and diagnosis of anemia. *Blood Res*. 2013;48(1):10–15.

Das I, Saha K, Mukhopadhyay D, et al. Impact of iron deficiency anemia on cell-mediated and humoral immunity in children: a case control study. *J Nat Sci Biol Med.* 2014;5(1):158–163.

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

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

Drugs@FDA: FDA-Approved Drug Products. Ferric derisomaltose. August 1, 2024. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2024/208171s003lbl.pdf. Accessed May 2025.

Drugs@FDA: FDA-Approved Drug Products. Ferumoxytol. June 16, 2022. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2022/022180s025lbl.pdf. Accessed May 2025.

Drugs@FDA: FDA-Approved Drug Products. Iron dextran. August 1, 2024. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2024/017441s181lbl.pdf. Accessed May 2025.

Drugs@FDA: FDA-Approved Drug Products. Iron sucrose. August 1, 2024. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2024/021135s038lbl.pdf. Accessed May 2025.

Drugs@FDA: FDA-Approved Drug Products. Sodium ferric gluconate. February 28, 2012. Accessed May 2025.

Drugs@FDA: FDA-Approved Drugs. Ferric carboxymaltose. January 3, 2025. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/203565s020lbl.pdf. Accessed May 2025.

Fitzsimons S, Doughty RN. Iron deficiency in patients with heart failure. *Eur Heart J Cardiovasc Pharmacother*. 2015;1(1):58–64.

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(5):342-353.

Gafter-Gvili A, Rozen-Zvi B, Vidal L, et al. Intravenous iron supplementation for the treatment of chemotherapy-induced anaemia - systematic review and meta-analysis of randomised controlled trials. *Acta Oncol*. 2013;52(1):18-29.

Gemici C, Yetmen O, Yaprak G, et al. Is there any role of intravenous iron for the treatment of anemia in cancer? *BMC Cancer*. 2016;16(1):661.

Gilreath J, Makharadze T, Boccia R, et al. Efficacy and safety of ferric carboxymaltose injection in reducing anemia in patients receiving chemotherapy for non-myeloid malignancies: a phase III, placebo-controlled study (IRON-CLAD). *Blood.* 2019;134(1):3535.

Gilreath JA, Rodgers GM. How I treat cancer-associated anemia. *Blood*. 2020;136(7):801-813.

Gilreath JA, Stenehjem DD, Rodgers GM. Diagnosis and treatment of cancer-related anemia. *Am J Hematol*. 2014;89(2):203-212.

Girelli D, Nemeth E, Swinkels DW. Hepcidin in the diagnosis of iron disorders. *Blood.* 2016;127(23):2809–2813.

Harper P, Littlewood T. Anaemia of cancer: impact on patient fatigue and long-term outcome. *Oncology*. 2005;69 Suppl 2:2-7.

Hentze MW, Muckenthaler MU, Galy B, Camaschella C. Two to tango: regulation of Mammalian iron metabolism. *Cell.* 2010;142(1):24–38.

Jang JH, Kim Y, Park S, et al. Efficacy of intravenous iron treatment for chemotherapy-induced anemia: A prospective Phase II pilot clinical trial in South Korea. *PLoS Med*. 2020;17(6):e1003091.

Kanuri G, Sawhney R, Varghese J, et al. Iron Deficiency Anemia Coexists with Cancer Related Anemia and Adversely Impacts Quality of Life. *PLoS One*. 2016;11(9):e0163817.

Keeler BD, Dickson EA, Simpson JA, et al. The impact of pre-operative intravenous iron on quality of life after colorectal cancer surgery: outcomes from the intravenous iron in colorectal cancer-associated anaemia (IVICA) trial [published correction appears in Anaesthesia. 2019 Sep;74(9):1191]. *Anaesthesia*. 2019;74(6):714-725.

Keeler BD, Simpson JA, Ng O, et al. Randomized clinical trial of preoperative oral versus intravenous iron in anemic patients with colorectal cancer. *Br J Surg*. 2017;104(3):214-221.

King RL, Weiss MJ. Iron-laden macrophage in autoimmune disease. *Blood*. 2014;123(4):469.

Lim J, Auerbach M, MacLean B, Al-Sharea A, Richards T. Intravenous Iron Therapy to Treat Anemia in Oncology: A Mapping Review of Randomized Controlled Trials. *Curr Oncol*. 2023;30(9):7836-7851.

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

Ludwig H, Van Belle S, Barrett-Lee P, et al. The European Cancer Anaemia Survey (ECAS): a large, multinational, prospective survey defining the prevalence, incidence, and treatment of anaemia in cancer patients. *Eur J Cancer*. 2004;40(15):2293–2306.

Madeddu C, Gramignano G, Astara G, et al. Pathogenesis and Treatment Options of Cancer Related Anemia: Perspective for a Targeted Mechanism-Based Approach. *Front Physiol*. 2018;9:1294.

Makharadze T, Boccia R, Krupa A, et al. Efficacy and safety of ferric carboxymaltose infusion in reducing anemia in patients receiving chemotherapy for nonmyeloid malignancies: a randomized, placebo-controlled study (*IRON-CLAD*). *Am J Hematol*. 2021;96(12):1639–1646.

Marinho J, Leão I, Custódio S, et al. Ferric carboxymaltose (FCM) in the treatment of chemotherapy-induced anaemia: an effective, safe, and cost-sparing alternative to blood transfusion. *Sci Rep*. 2019;9(1):20410.

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.

Mhaskar R, Wao H, Miladinovic B, et al. The role of iron in the management of chemotherapy-induced anemia in cancer patients receiving erythropoiesis-stimulating agents. *Cochrane Database Syst Rev*. 2016;2(2):CD009624.

Muñoz M, Villar I, García-Erce JA. An update on iron physiology. *World J Gastroenterol.* 2009.

National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines. Hematopoietic Growth Factors. Version 1.2025. October 11, 2024. Available at: https://www.nccn.org/professionals/physician_gls/pdf/growthfactors.pdf. Accessed May 2025.

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.

Pagani A, Nai A, Silvestri L, Camaschella C. Hepcidin and Anemia: A Tight Relationship. *Front Physiol*. 2019;10:1294.

Pantopoulos K, Porwal SK, Tartakoff A, et al. Mechanisms of mammalian iron homeostasis. *Biochemistry*. 2012;51(29):5705–5724.

Petrelli F, Borgonovo K, Cabiddu M, et al. Addition of iron to erythropoiesis-stimulating agents in cancer patients: a meta-analysis of randomized trials. *J Cancer Res Clin Oncol*. 2012;138(2):179-187.

Rodgers GM, Becker PS, Blinder M, et al. Cancer- and chemotherapy-induced anemia. *J Natl Compr Canc Netw*. 2012;10(5):628–653.

Rodgers GM, Gilreath JA. The role of intravenous iron in the treatment of anemia associated with cancer and chemotherapy. *Acta Haematol*. 2019;142(1):13–20.

Rodgers GM. Update on iron supplementation in patients with cancer-related anemia. *Expert Rev Hematol*. 2024;17(8):505-514.

Rodgers GM. A perspective on the evolution of management of cancer- and chemotherapy-induced anemia. *J Natl Compr Canc Netw*. 2012;10(4):434–437.

Steinmetz T, Tschechne B, Harlin O, et al. Clinical experience with ferric carboxymaltose in the treatment of cancer- and chemotherapy-associated anaemia. *Ann Oncol*. 2013;24(2):475-482.

Talboom K, Borstlap WAA, Roodbeen SX, et al. Ferric carboxymaltose infusion versus oral iron supplementation for preoperative iron deficiency anaemia in patients with colorectal cancer (FIT): a multicentre, open-label, randomised, controlled trial [published correction appears in Lancet Haematol. 2023 Jun;10(6):e399]. *Lancet Haematol*. 2023;10(4):e250-e260.

Tatake IJ, Freed JA. Evaluation and Treatment of Iron Deficiency for the Practicing Oncologist. *JCO Oncol Pract*. Published online June 27, 2025.

U.S. National Library of Medicine. ClinicalTrials.gov. Available at: www.clinicaltrials.gov. Accessed May 2025.

Vela D. Balance of cardiac and systemic hepcidin and its role in heart physiology and pathology. *Lab Invest.* 2018;98(3):315–326.

Verhaeghe L, Bruyneel L, Stragier E, et al. The effectiveness of intravenous iron for iron deficiency anemia in gastrointestinal cancer patients: a retrospective study. *Ann Gastroenterol*. 2017;30(6):654-663.

Wang C, Graham DJ, Kane RC, et al. Comparative risk of anaphylactic reactions associated with intravenous iron products. *JAMA.* 2015;314:2062–2068.

Zhang C. Essential functions of iron-requiring proteins in DNA replication, repair, and cell cycle control. *Protein Cell*. 2014;5(10):750–760.

