Background: Heart failure (HF) occurs when the heart fails to pump blood and oxygen to support the needs of the body. Leading causes include coronary artery disease, heart attack, or chronic conditions such as diabetes and hypertension. It’s estimated that over 50% of ambulatory patients with HF have iron deficiency anemia, and independently can predict worse outcomes in this population. No current guidelines exist regarding the optimal approach to treatment of iron deficiency and iron deficiency anemia in this population. The purpose of this case study was to review current research as it relates to a patient case and provide evidence-based practice guidelines.

Case: A 65-year old male initially presented for acute HF exacerbation. Past medical history was significant for iron deficiency anemia, stroke, ST-elevated myocardial infarction, ischemic cardiomyopathy, hypertension, type 2 diabetes, and colon cancer. Labs confirmed persistent iron deficiency anemia and the patient received his home regimen of daily ferric gluconate supplementation while hospitalized.

Discussion: A randomized-controlled trial conducted by Anker et al published in 2009 evaluated the impact of intravenous (IV) ferric carboxymaltose on New York Heart Association (NYHA) HF classification and the Patient’s Global Assessment in 459 patients with HF with reduced left ejection fraction (EF) and iron deficiency. After 24 weeks, NYHA functional class improved by 47% in those who received IV iron compared to 30% in placebo controls. Additionally, 50% reported significant improvement in quality of life. Another randomized-controlled trial by Ponikowski et al published in 2020 investigated the effect of IV ferric carboxymaltose supplementation on clinical outcomes in patients stabilized after hospitalization for HF episode in 1,132 patients. The primary outcome was total HF hospitalizations and cardiovascular (CV) death secondary outcomes were total CV hospitalizations and CV death up to 1 year. The investigators did not observe a statistically significant reduction in HF hospitalizations and CV death, however they did observe a significant reduction in all secondary outcomes except for CV death. Finally, Kalra et al conducted a randomized-controlled trial evaluating the effect of IV ferric derisomaltose supplementation on long-term CV events in 1,137 patients with HF. Iron supplementation was not associated with a statistically significant reduction in HF and CV death on un-controlled analysis; however, the relationship was significant after controlling for the impact of the COVID-19 pandemic.

Conclusion: IV iron may benefit heart failure patients to reduce frequency of hospitalization and increase quality of life. The treatment effect of oral iron supplementation was not studied in the reviewed research. Studies completed after 2019 were impacted by COVID-19. In at least one study, controlling for COVID-19 resulted in a significant finding, therefore the potential impact of the pandemic on the conduct of these RCTs cannot be ignored.