

## Intravenous Iron Therapy (IVIT) Improves Patient-Reported Outcomes and Immunothrombotic Response Following Orthopaedic Trauma: A Pilot Randomized Controlled Trial

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**Purpose:** Injury-associated anemia is prevalent yet largely neglected in orthopaedic trauma patients. We hypothesize that intravenous iron therapy (IVIT) mitigates negative effects of anemia after fracture care.

**Methods:** This double-blind randomized controlled trial (RCT) evaluated IVIT for treatment of anemia after operative orthopaedic trauma (single, Level I academic, 2022-2024). Eligible subjects were adults with an operative lower extremity or pelvis fracture and hemoglobin 7-11 g/dL postoperatively. Subjects received a single dose of low-molecular weight iron dextran (1000 mg) or saline placebo (randomized 1:1) within 7 days of surgery. Patient-Reported Outcomes Measurement Information System (PROMIS) surveys, iron homeostasis, blood counts, plasma markers, and platelet function were assessed at baseline through 12 weeks postoperatively. A mixed-effects model was employed for multivariate analysis.

**Results:** 36 subjects were eligible for analysis (19 IVIT, 17 placebo); 86% overall follow-up was achieved. Figure 1 outlines significant results after IVIT vs placebo, including: (a) improved and maintained body iron stores (e.g., ferritin), (b) improved fatigue and depression scores, (c) attenuation of key inflammatory plasma cytokine elevations (interleukin [IL]-1 $\beta$ , tumor necrosis factor [TNF] $\alpha$ , eotaxin), and (d) reversal of platelet exhaustion and improved platelet agonist reactivity.

**Conclusion:** Exploratory pilot data demonstrate IVIT improves quality of life, attenuates systemic inflammatory responses, and restores platelet function after orthopaedic trauma. Future large scale RCTs will confirm and specify benefits of IVIT in this population.

### OTA GRANT

