

# Lessons Learned from Jehovah’s Witness Patients: Using a Novel Algorithm to Calculate the Preoperative Hemoglobin Target Required to Avoid Transfusions

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## Background

- Optimizing preoperative hemoglobin to account for predicted blood loss is essential.
- We describe a novel algorithm, derived from the allowable blood loss formula, that is based on body mass and expected blood loss. The formula allows for the calculation of the ideal target preoperative hemoglobin required to avoid transfusion.

## Methods

- We analyzed our bloodless patient database for spinal surgical procedures completed from 2012 – 2022.
- We identified 26 patients who declined blood transfusions for religious or personal reasons.
- Hemoglobin concentrations were assessed at four-time intervals:
  1. Prior to anemia treatment
  2. Post anemia treatment preoperatively
  3. Immediately postoperative
  4. Upon discharge

## Results

- Intraoperatively, just over half of patients received tranexamic acid, and only 3 patients had enough blood loss to allow salvaged blood reinfusion.
- There was a wide range for blood loss (40 – 1000mL), which showed the algorithm’s predictive ability at both the high and low ends of the spectrum.
- The mean hemoglobin concentration decreased approximately 1.5 g/dL after surgery, and the lowest hemoglobin upon discharge was 6.7 g/dL.
- There were no in-hospital mortalities.

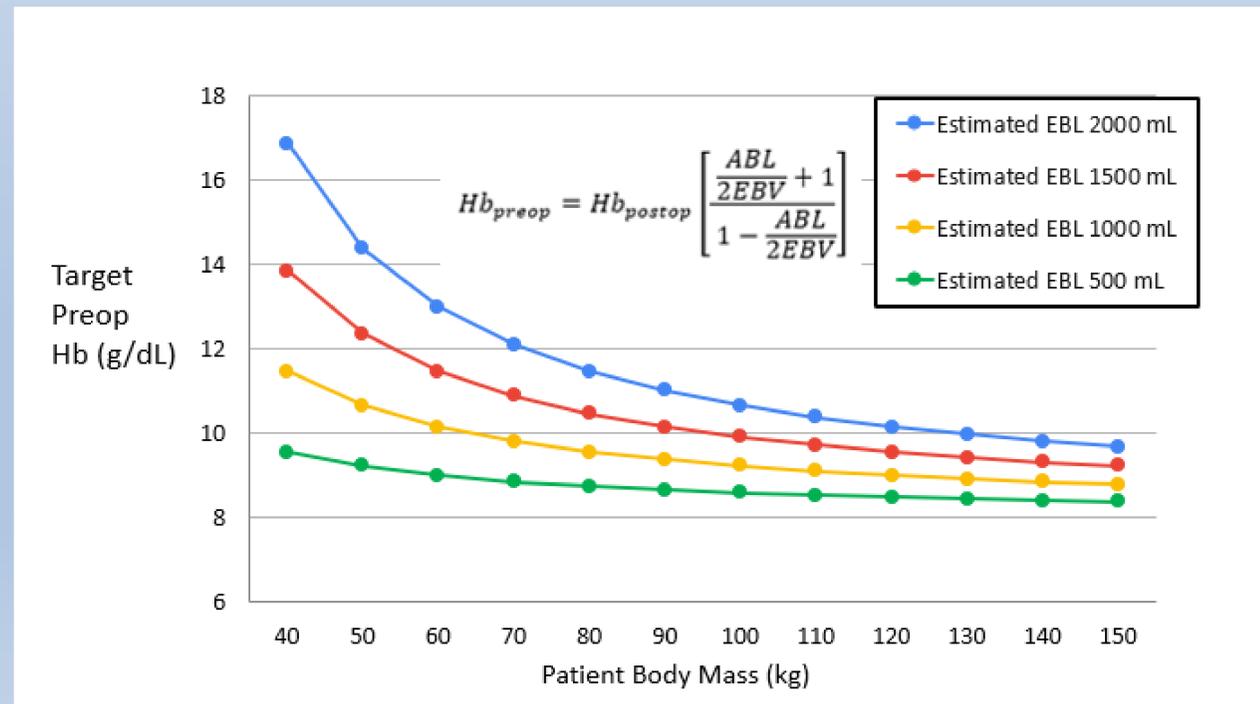


Figure 1: Formula and Nomogram to Calculate Target Perioperative Hemoglobin

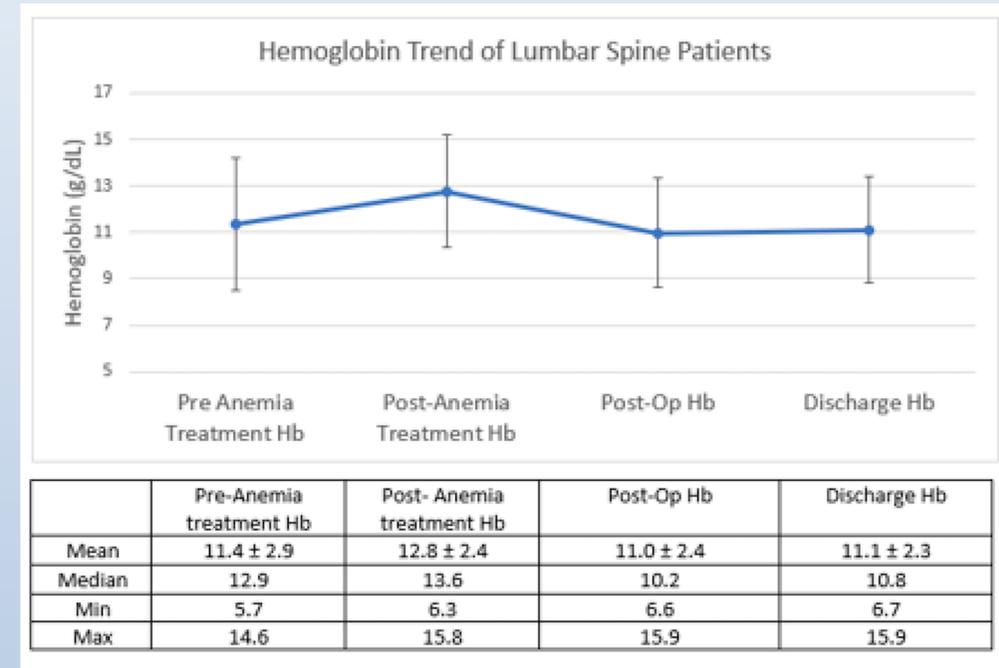


Figure 2: Trend of Hemoglobin concentrations for 26 Bloodless Lumbar Spine Patients

## Clinical Implementation & Conclusion

- The algorithm we present was useful in calculating the target preoperative hemoglobin concentration required to safely allow surgery, while avoiding clinically significant postoperative anemia.
- This algorithm will be useful to guide preoperative anemia treatment even for patients who accept transfusions.