

# Blood-Sparing Techniques in Head and Neck Surgery



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## KEYWORDS

- Blood sparing • Jehovah's witness • Allogenic blood transfusion
- Bloodless medicine • Acute normovolemic hemodilution
- Preoperative autologous donation • Controlled hypotension • Cell saver

## KEY LEARNING POINTS

At the end of this article, the reader will:

- Understand why we need blood-sparing techniques.
- Know which kinds of blood products are and are not acceptable to Jehovah's Witnesses.
- Know the preoperative, intraoperative, and postoperative techniques that can be used to decrease blood loss/reduce the need for allogenic blood transfusion.

## INTRODUCTION

### Why do we need blood-sparing techniques?

- Risk of perioperative anemia in head and neck patients is high.
- Consequences of anemia include increased morbidity and mortality perioperatively, particularly for cancer patients.
- Patients for whom blood transfusion not an option:
  - Religious beliefs.
  - Fear of the risks or complications of transfusion.
  - Medical contraindications.
  - Logistical issues.
- This has led to the development of bloodless surgery programs.

Anemia frequently complicates the treatment of surgical patients. The high vascularity of the head and neck can foster significant blood loss during surgery. For example, allogenic blood transfusion (ABT) rates are quoted as high as 84% in head and neck cancer patients perioperatively.<sup>1,2</sup> Noteworthy factors that may predict the

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need for blood transfusion in head and neck oncologic surgery include the preoperative hemoglobin (Hb) level, patient age, the site and extent of the primary tumor, the need for flap reconstruction, and prior chemotherapy.<sup>1</sup> In addition to tumor location and stage, anemia of chronic disease, nutritional factors, and chemotherapy are all major contributors to preoperative anemia and should be monitored and corrected when possible.<sup>3</sup> The effects of anemia on the surgical patient are wide-ranging and serve not only as a major risk factor for transfusion, but also as an independent predictor of morbidity and mortality.<sup>4</sup>

Traditionally, correction of anemia took place via ABTs. However, for a variety of reasons there remain populations unable to receive this option. For example, religious beliefs (Jehovah's Witnesses), fear of the risks and complications of transfusion, medical contraindications (ie, presence of autoantibodies), or logistical issues (ie, rare blood groups, unavailability of blood components) may preclude a patient from accepting a blood transfusion.<sup>5</sup> Additionally, ABTs are not without complication, and may result in transfusion reactions, fever, hemolysis, lung injury, and immunodeficiency.<sup>6</sup>

Bloodless medicine and surgery programs have developed out of a need to find alternative means to treat acute and chronic anemia in patients who cannot receive ABTs. The goal of this article is to acquaint the otolaryngologist with alternative methods of managing blood loss and anemia in their surgical patients who cannot or should not receive ABTs.

## JEHOVAH'S WITNESSES

- Aversion to ABT is rooted in their literal interpretation of the Bible.
- Refuse allogenic whole blood and its major components:
  - Red cells
  - White cells
  - Platelets
  - Plasma
  - Predonation of autologous blood
- Acceptance of "minor" blood components decided on individual basis:
  - Albumin
  - Immunoglobulin
  - Vaccines
  - Clotting factors
  - Prothrombin complex concentrates
- Reinfusion of autologous blood kept linked to the patient is usually acceptable:
  - Cardiopulmonary bypass
  - Hemodialysis
  - Cell salvage
  - Acute normovolemic hemodilution

The Jehovah's Witness faith began in Philadelphia, Pennsylvania, in the 1870s as a Bible study group.<sup>7</sup> A cornerstone of this religion is the literal interpretation of Bible passages. Passages such as "Every moving animal that is, alive may serve as food for you...Only flesh with its soul—its blood—you must not eat" from Genesis 9:3,4 are taken literally as a ban of blood via any route.<sup>7</sup> As such, a refusal of blood transfusions is a core value of their faith.<sup>8</sup> Disobeying this ban taints the recipient's immortal soul leading to shunning by friends, family, and the entire Jehovah's Witness community.<sup>7</sup>

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