Ethics of Surgical Intervention in Jehovah's Witness Patients

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Key Points

- The principle tenant in Jehovah's Witness patients in relation to health care is their religious prohibition to accepting blood products. However, while most Jehovah's Witness patients firmly reject actual blood products, some individuals may be lenient on blood analogues or isolated coagulants. Therefore, it is important to respect the autonomy of the patient by having a detailed and comprehensive informed consent regarding each of those agents.
- Most Jehovah's Witness patients will have a liaison that can help with a checklist of products that are permissible for each individual patient. Each patient must be treated on a case-by-case basis.
- During the informed consent process, it is imperative that the patient understands the higher risk of death. After careful discussion, they need to clearly express their desire that they would rather die rather than receiving life-saving transfusions.
- The surgeon must look at all alternatives and weigh other treatments balancing the efficacy of the treatment versus the risk of death.
- Multidisciplinary care and preoperative planning with all necessary departments are crucial to optimizing the patient's preparation prior to surgery.
- Meticulous surgical technique to minimize blood loss and having protocols in place in case massive bleeding is encountered intraoperatively are important aspects in treating for any patients, especially Jehovah's Witness patients.
- Early vigilance, recognition, and intervention in the postoperative period will minimize blood loss and safely guide the Jehovah's Witness patients through recovery.
- Perioperative techniques to minimize blood loss and transfusions should be employed in all patients, not just Jehovah's Witness patients.
- Access to health care and any surgical interventions should not be denied to any patients solely on the grounds of their religious beliefs.

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Introduction

The right of every person to either approve or reject medical and surgical therapies is well established in ethics and law. Jehovah's Witness patients represent a well-known group of individuals that pose a major challenge in their surgical care. The most defining tenant for Jehovah's Witness patients in the setting of health care is their strict prohibition against receiving blood. This limitation poses a higher risk of complications from profound anemia, should bleeding occur for these patients. This is especially the case in high-risk surgeries, with increased possibility of morbidity and mortality. In an era where a surgeon is defined and judged on publicly reported quality metrics, it seems illogical and irresponsible that a patient can be exposed to the risk of death from exsanguination that can be prevented with transfusion. However, this is the challenge that the modern surgeon faces when tasked with providing surgical care to a Jehovah's Witness patient. Their belief in rejecting blood products and other medical resources also opens up ethical and moral implications that the surgeon has to respect and comply with.

The contract between the surgeon and the Jehovah's Witness patient includes two parties – one of these is the surgeon him-/herself. It is important that the additional stress of taking care of Jehovah's Witness patients on the psychological state of the surgeon be recognized. In fact, the Jehovah's Witness community tends to be very understanding of the responsibility that the surgeon is taking on. However, does the medical community feel the same way? Or is the surgeon judged by the same standards as if he or she had the luxury of using blood products? These are ethical questions raised for further discussion.

This chapter provides a succinct overview of the history and beliefs of Jehovah's Witnesses followed by the discussion on ethical and legal ramifications of their beliefs that may affect surgical practice and the various contingencies and options that the authors utilize, which are not only applicable to Jehovah's Witnesses but to all patients to prevent and minimize complications.

Historical Background and Transfusion Beliefs of Jehovah's Witnesses

The Jehovah's Witness religion was initially instituted under the name of the Watchtower Bible and Tract Society founded in 1879 by Charles Taze Russell, a Western Pennsylvania businessman [1]. The Society was restructured under the direction of a society of international Bible students in 1931, and the name was changed to Jehovah's Witnesses. The religion is primarily based on the prophecy of Armageddon or "the end of the world" as described from the Bible. Teachings from Jehovah's witnesses specify that as "true" Christians, Jehovah's witnesses will be saved at the time of Armageddon and the second coming of Christ and will be ushered into heaven and eternal life. Today there are over six million Jehovah's Witnesses in 235 countries and territories. Nearly one million of them are in the United States. Their numbers are increasing, particularly in Central and South America, Italy, Japan, and Eastern Europe.

As a matter of firm religious belief, Jehovah's Witnesses are prohibited by their governing body for utilizing blood products and blood-like substances. The Watchtower Bible and Tract Society instituted this policy of refusal of transfusions in 1945. This prohibition is based on at least three citations from the bible:

- "But you shall not eat flesh with its life, that is, its blood." (Genesis 9:4. English Standard Version)
- "There I say to the Israelites, None of you may eat blood, nor may any foreigner residing among you eat blood." (Leviticus 17:12. English Standard Version)
- "…that you abstain from what has been sacrificed to idols, and from blood, and from what has been strangled, and from sexual immorality. If you keep yourselves from these, you will do well…" (Acts 15:29 English Standard Version)

The reason for this policy is based on the belief that "blood, irrespective of the manner of

consumption, serves as a nutrient," and acceptance would be defying divine precepts. Based on this policy, the refusal of transfusions of whole blood (including preoperative autologous donation) and primary blood components – red cells, platelets, white cells, and unfractionated plasma – remains nonnegotiable for nearly all Jehovah's Witnesses. However, acceptance of blood product alternatives and/or components such as albumin, all clotting factors, all immunoglobulins, interferons, and interleukins is up to individual patients (Transfusion Handbook 2014). This directive further complicates surgical care of Jehovah's Witness since now it is up to each Jehovah's Witness patient to determine what blood product alternatives and/or components they will and will not accept.

Moral Framework

The "Four Principles" of medical ethics were introduced by American philosophers Tom Beauchamp and James Childress in the 1970s [2]. These principles of beneficence, autonomy, nonmaleficence, and justice provide a moral framework in which to discuss the ethical implications for providing medical care to any patients. The authors will use these principles in discussing the ethical implications of caring for a Jehovah's Witness patient.

Beneficence

Beneficence refers to the commitment by the medical professional to benefit patients by acting in their best interest. This means having comprehensive knowledge of the patient's wishes and beliefs. In the case of the surgeon and Jehovah's Witness, this would involve perioperative planning in such a way to minimize harm. In this sense, there is a close association of beneficence to autonomy and nonmaleficence which will be discussed below. The onus is on the surgeon to conduct him-/herself in a responsible and professional manner with full disclosure of the disease process that the patient has, the appropriate steps to work up the problem, the ideal surgical plan with frank discussion of realistic chances of a cure and/or control of symptoms, and a realistic discussion of the expected postoperative recovery with disclosure of chances of possible complications. For the best interest of the patient, the surgeon has a duty to continuously develop his/her knowledge base and technical skills through professional development, exercise the utmost competence during surgical care, and display the ability to exercise sound judgment. As the sole advocate for the patient's life, it falls on the surgeons to maximize the conditions surrounding themselves and the environment in which the patient will receive their care to minimize potential risks of hospital-borne infections, poor nutrition, deconditioning, and other potentially preventable complications to the patients. If the surgeon has personal issues occurring that prevents him or her from maximally performing for the patient, it is the ethical duty of that surgeon to disclose that to the patient and allow the patient the choice of being cared for by a different surgeon. If the surgeon feels that they have inherent bias that would not allow for the principle of beneficence, they should recluse themselves from taking care of the Jehovah's Witness patient.

Even if the surgeon is at full functional capacity, before taking on a case involving a Jehovah's Witness patient, the surgeon has to be willing to take on the risk themselves. Self-reflection and honesty with oneself are critical elements in this process. It is imperative that the surgeon asks himself/herself if he/she is willing to accept the higher chance of death in the surgery involved. It is the authors' experience that the devout Jehovah's Witnesses will ask the surgeon if he/she is "okay with proceeding?" This question usually informs the surgeon that the patient has a clear insightful understanding that there is a contract between the patient and the surgeon regarding the proposed procedure which is risker than normal.

Not all surgeons are willing to take on this additional risk. In the event of an outcome that could have been altered by the addition of blood elements, the surgeon has to be very secure in his/her decision to operate on the patient. There

are many factors that impact this decision. Some critical elements are:

1. The likelihood of death without surgery. In the authors' opinion, there has to be a high likelihood of death due to the patient's disease process in order to take on the risk of surgery in a Jehovah's Witness patient.
2. The likelihood of death from bleeding with the surgery. This is of great importance in many surgical fields, such as cardiac, vascular, and hepatopancreaticobiliary, as they are all at high risk for bleeding [3].
3. The relationship between the surgeon and the patient. There has to be an excellent rapport between the two. This may mean more detailed and frequent meetings to discuss perioperative complications and care with the patient. Documentation is paramount and having the liaison (see below) present may be helpful.
4. Importance of comorbidities. The impact of comorbidities that may be especially affected by anemia or inability to correct blood coagulation may be of greater importance in the Jehovah's Witness patient. For example, in a patient with metastatic tumor to the liver in the presence of chronic liver disease (CLD), a surgeon may agree to a minor resection in a well-compensated CLD patient knowing that red blood cells, platelets, and fresh frozen plasma (FFP) are available should there be an issue. However, such a procedure may be too morbid in a Jehovah's Witness patient, and the surgeon's decision may be altered. The authors feel that the risk of death from comorbidities at 1 year must be less than the risk of death from the process requiring surgery. For example, if the patient has a resectable hepatocellular carcinoma (HCC) in a non-cirrhotic liver and has coronary disease that is well compensated, we would ask the cardiologist to give us the risk of death from heart disease at 1 year. If this is less than the risk of death from unresected HCC, it would be our practice to consider surgery in that patient.
5. The option of other modalities that may require less blood products. The surgeon must consider other options that might be as effective for the condition being treated. Taking the example above, such consideration is critical in a patient with a metastatic liver tumor with CLD where ablation may be the second best option in the surgeon's mind compared to resection. However, in a Jehovah's Witness patient, ablation might rise to the top of the list in order to provide a safer option for the patient with significantly less potential for bleeding. It is also the responsibility of the surgeon, with his/her comprehensive knowledge of the disease process, to protect the patient from harmful treatment options. For a surgical oncologist, for example, it is unreasonable to expect that chemotherapy is a realistic option in a patient that would require agents that would substantially cause marrow suppression and high risk of blood component transfusion [4].
6. Are there options to decrease bleeding ahead of surgery? The use of adjuncts to assist in blood loss intraoperatively should be investigated. The surgeon must not feel that the use of these measures makes them any "less" of a surgeon. An example of a surgeon adjunct would be the use of transarterial chemoembolization (TACE) of a liver lesion prior to surgery. While this seems attractive at first glance to decrease the risk of bleeding, there is a trade-off in that there is an increased inflammatory response to TACE that can make the dissection more technically challenging. Such potential pros and cons of adjuncts must be weighed by the surgeon prior to surgery.

Autonomy

The literal meaning of autonomy is "self-rule," and it refers to the right of an individual to make a choice based on his/her belief and value. In the context of surgical care, this means obtaining an informed consent of all aspects of perioperative care, not just the actual surgical intervention. A patient has the legal right to decide to forego treatments that are clinically necessary if the patient is deemed to be competent to make that decision. It is important for the reader to understand that all patients exercise this choice to some degree – we, as physicians, are just more aware

of autonomy in the Jehovah's Witness patient. For example, a patient choosing to forego a recommended colonoscopy is exercising their right of autonomy. We do not recognize this as such, as the consequences are felt to be minimal in this specific case. For any procedure, it is important to have a thorough discussion with the patient and obtain an informed consent. The authors often follow a specialized informed consent form for Jehovah's Witness patients with emphasis on discussion of complications that would normally require transfusion of blood products. Such a checklist is crucial in comprehensively reviewing with the patient all the available options for optimizing, correcting, and repleting the patient's hemoglobin level perioperatively (Table 1). Since

Table 1 Informed consent checklist for Jehovah's Witness

Informed consent tailored for Jehovah's Witness Checklist
1. Check to see if patient has advanced directive. Review of all relevant documentation
2. Explanation of preoperative planning (a) Discuss all preoperative tests and imaging (b) Consultation to relevant specialties and follow-up on all documentations and/or tests run by those consulting physicians (c) Discussion of all medications to optimize patient's condition (i) Obtain patient's permission for use after explanation of these medical interventions (d) Explanation of follow-up visit schedule prior to surgery
3. Explanation of procedure (a) Especially highlight any points where risk of hemorrhage is high
4. Explanation of all risks (a) Discuss potential for significant and/or fatal hemorrhage (i) Confirm that patient will not consent to blood products (packed RBC, WBCs, FFP, cryoprecipitate, platelets) (ii) Determine whether patient consents to synthetic colloid solution (albumin, hetastarch, dextran, gelatin), hemoglobin-based substitutes (perfluorocarbons) and recombinant proteins (erythropoietin, activated factor VII) (iii) Preoperative strategy – Iron sulfate, folic acid, vitamin B12, erythropoietin, granulocyte colony-stimulating factor, hyperbaric oxygen therapy (iv) Intraoperative strategy – Hemostatic agents (Gelfoam, Surgicel, Evarrest, etc.), injectable agents (desmopressin, ε-aminocaproic acid, tranexamic acid, vitamin K), acute normovolemic hemodilution, intraoperative blood salvage (cell saver) (v) Postoperative strategy – Same as above (b) Discuss potential for acute kidney injury (if relevant) and the use of dialysis (i) Closed circuit usually employed with no blood prime used, no blood storage (c) Discuss potential for thromboembolic event (if relevant) (i) IVC filter? (if relevant) (ii) Discuss possible use of anticoagulation if indicated unless patient has a higher risk of hemorrhage (d) Discuss potential for other events (if relevant) that may increase chance of hemorrhage
5. Explanation of potential benefits (a) Discuss outcome for patient if surgical procedure is completed
6. Explanation of alternative treatment (a) Discuss outcome for patient if surgical procedure is not completed (b) Discuss other interventions and their outcomes compared to surgery (c) Weigh the risk of death due to uncontrolled hemorrhage during surgical intervention versus risk of morbidity/mortality if procedure not performed and discuss with patient
7. Discuss with patient his/her wishes if fatal massive hemorrhage is encountered. Is the patient willing to die rather than receiving life-saving transfusion?
8. Explanation of postoperative care (a) Discuss expected routine postoperative course (b) Discuss all possible complications again (i) Discuss plans on how we will monitor for these complications (ii) Discuss interventional plans and obtain patient's approval (c) Discussion of all medications to optimize patient's condition (i) Obtain patient's permission for use after explanation of these medical interventions (d) Explanation of follow-up visit after hospital discharge
9. Give patient and family ample opportunity to ask any questions/concerns

each Jehovah's Witness patient may differ on what hematopoietic alternatives he/she may consent to, it is imperative for the clinician to explain what each medication or solution is comprised of so that the patient can make an informed decision on what he/she will allow to be infused into their body.

Before speaking with the patient, all relevant documents are reviewed, and special attention is paid to the patient's advanced directive if there is one. Preoperative steps are explained in detail, as well as medications that may be used to improve patient's hemoglobin and clotting levels. Then the procedure is explained in detail, highlighting the surgical steps where bleeding may be an issue. Each type of blood products is reviewed with the patient, and the authors take note of whether the patient would approve of products like fresh frozen plasma, cryoprecipitate, and/or platelets. Various colloid solutions are all reviewed to see whether the patient would permit infusion. Various hematopoietic medications (iron, folic acid, vitamin B12, erythropoietin) as well as anticoagulation medications are reviewed and are approved or disapproved by the patient. Intraoperative hemostatic devices and agents are reviewed, with clear disclosure that some of these agents contain human or bovine fractions of blood. All other complications are discussed in detail with the patient. Potential benefits, alternative treatment options other than the proposed surgical procedure, and outcomes if the procedure is not performed are all reviewed with the patient. Perhaps the most important portion of the consent is to convey to the patient that there may be a real risk of death and that the patient would prefer death rather than consenting to a life-saving transfusion [5]. Then our consent is signed by the patient, the physician, and a staff witness.

The surgeon must have good insight to discern whether the patient's understanding, and agreement, of the consent was clouded by emotional factors. Such emotions such as fear, anxiety, embarrassment, pressure from family, spiritual guides, etc. or stress from such things as finances, etc. can all negatively influence the patient's decision. If such factors do exist, counseling should be provided by appropriate personnel prior to obtaining informed consent. Persuasion, manipulation, and coercion are various influential forces that can also mar an informed consent. Persuasion can be a negative if it incites an emotional reaction that drives a patient's decision. Manipulation occurs when a physician presents the relevant information in a biased way, misrepresenting or even withholding information and is an ethical violation. Coercion, the use of force or threats, is the ultimate underminer of autonomy [6]. The surgeon must be cognizant of the possibility of coercion by other family members or friends. If this is detected, we recommend interviewing the patient alone and asking them to designate a power of medical attorney that they choose. This person should be included in all discussions and be tasked with communicating with the family. There are circumstances where the family appears to be coercing the patient into refusing blood when the patient him-/herself is fine with this.

In general, it is best if the entire family is included in all discussions. There is little conflict when the patient and the family are all Jehovah's Witnesses. However, when some or all members of the family are not Jehovah's Witnesses, real conflict can arise. The issue becomes who has the right to decide to allow blood products if the patient is in extremis. It is vital that the surgeon and the team have a clear discussion with all involved and make it clear that the patient's wishes will be honored should there be an issue of profound anemia that could lead to death. Indeed, the authors have experience where the family wanted transfusion when the Jehovah's Witness patient did not. The family called for the ethics team to get involved. This can be a tough situation that can create friction between the treating physician and the family. Our practice is to have the patient work with the Jehovah's Witness liaison regarding a "checklist" of products that the patient will accept. This is a qualified officer whose main aim is to ensure that the patient can make an informed decision with manipulation or coercion. The liaison will generally present a checklist that will be filled out with the patient.

Legal and ethical standards regarding the autonomy of Jehovah Witness minors (patients under the age of 18) can be confusing to the medical community. It is important to note that although the patient's parents may be devout Jehovah's Witnesses, the minor might not be. US federal statute gives physicians the authority to provide emergency medical care to minors including blood transfusions without the consent of the parents or without a court order, provided that the physician determines that there is an immediate need for treatment and a second physician concurs. All surgeons should be encouraged to find out their respective state's laws regarding treatment of minors in other medical circumstances. In most cases, emancipated minors can consent to their own procedures. Non-emancipated minors are generally granted right to seek treatment in specific medical situations (i.e., pregnancy, psychiatric disturbance, substance abuse, treatment of sexually transmitted diseases).

Nonmaleficence

The principle of nonmaleficence refers to the moral and ethical obligation to not cause any intentional net harm to the patient. This principle is often considered in conjunction with the principle of beneficence. Nonmaleficence is rarely an overt issue with a treating surgeon, as it is unusual for a caring physician to intentionally harm a patient. The real question is one for the true inner soul of the surgeon: do they believe, at some level, that they are harming the patient by withholding blood products? This is an important self-realization process that the surgeon must go through to ensure that they can answer this question to the negative.

In the context of Jehovah's Witness patients, the principle of nonmaleficence stresses the importance of preoperative planning, optimizing the patient's condition for the upcoming surgery, and having contingencies in place intraoperatively and postoperatively in case there are complications, especially bleeding complications, to surgery.

The perioperative management of Jehovah's Witnesses requires a multidisciplinary strategy compatible with their religious beliefs. It is imperative for the surgical team to meet preoperatively with other specialities such as the anesthesiologist, hematologist, cardiologists, pulmonologists, and other medical disciplines to discuss preoperative optimization, intraoperative strategies, and postoperative blood conservation and bleeding surveillance plans. The hematologist, especially in the setting of blood dyscrasias, can be an important resource. Cardiac risk is relevant because relative ischemia can be made worse with hemodilution and decreased oxygen carrying capacity. Similarly, impaired pulmonary function can lead to potential challenges for the patient if there is decreased oxygen carrying capacity with blood loss and anemia.

Preoperative optimization of a Jehovah's Witness patient must start weeks to months prior to surgery if possible. The authors start with basic blood work as baseline measurement. Many of these non-transfusion strategies take days to weeks to see the effect, and thus early detection to optimize the patients is crucial. The authors routinely use iron, folic acid, vitamin B_{12}, and/or erythropoietin to replenish the patient's blood storage. Hematology is involved early to help optimize management. If further therapy is needed and the patient is agreeable, granulocyte colony-stimulating factor or other hematopoietic agents such as erythropoietin can be considered.

If the patient is on anticoagulation, interventions to reverse the anticoagulant affects are initiated. This aspect can be especially challenging, as there are scenarios with non-Jehovah's Witnesses where the surgeon will accept a less than perfect coagulation profile knowing that they can use blood components to correct these abnormalities. With the Jehovah's Witness patients, the surgeon has to take a calculated risk in stopping the anticoagulants. Usually the risk of clotting is a greater concern than the risk of bleeding, as long as there is the option to transfuse. In the Jehovah's Witness patients where there is no such option, the surgeon may have to accept a higher risk of a clotting phenomenon in order to minimize the risk of bleeding. Patients

can be taken off their anticoagulation medication at appropriate times preoperatively for the effects to wear off. Appropriate services such as cardiology are contacted beforehand so that we can safely take the patient off their medications. If the patient has current or history of thromboembolic disease, appropriate workup can be initiated, and preventative measurements such as inferior vena cava filters can be used to minimize future thromboembolic events. All of these interventions must be carefully discussed and agreed upon with the patient prior to activation.

Regarding intraoperative strategies, surgical planning with the anesthesiologist and the OR staff is crucial. The authors routinely meet and discuss care regarding our patients prior to the operative day, aiming for minimal blood draws during procedures and focusing on intraoperative monitoring devices to assess the patient's condition. Appropriate lines such as arterial and central venous lines are planned to be placed with minimal blood loss for monitoring purposes. Foley is placed to trend urine output as a measure of resuscitation. Permissive hypotension is employed in the operating room to minimize blood loss. This is especially the case during liver resections where the aim is low central venous pressure (CVP) anesthesia to minimize the bleeding from hepatic veins. The authors also routinely meet with our OR circulators and staff prior to the operation to make sure all medications and equipment are ready in the OR prior to starting the case.

Meticulous attention to hemostasis and minimizing technical blood loss during procedures is crucial. Detail-oriented surgical technique is employed while striving for hemostasis throughout the planned procedure. Each surgical procedure employs techniques to minimize blood loss. The surgeon must be familiar with blood-saving maneuvers and techniques in case complications arise during surgery. There are also a number of coagulating energy devices and hemostatic agents are available in the market, which may be used if the patients are informed and agreeable to them. Advanced energy devices such as the Harmonic (Ethicon™), Ligasure (Covidien™), etc. can be used for tissue transection. The authors recommend that each surgeon use devices that they have the most experience with and is the most comfortable. It is also important for the surgeon to have an in-depth knowledge of all the resources available and ready in case any bleeding is encountered during the operation.

Carefully surgical planning and proper imaging prior to surgery often gives us a roadmap to follow and allows us to anticipate any variations in blood vessel distribution, such as the often-encountered replaced right hepatic artery coming off of the superior mesenteric artery during a Whipple procedure. Any appropriate imaging modalities such as CT and/or MRI should be done leading up to the operation, with the images loaded up and viewable in the operating room on the day of surgery. The authors often employ intraoperative ultrasound as an adjunct in liver and pancreatic surgeries, identifying critical structures such as major blood vessels. Anticipating these structures prior to encounter will ensure that those vessels will not be accidentally clipped or ligated prior to proximally and distally control.

There are a number of blood-saving and blood-salvaging techniques that are described. The surgeon must be familiar with these techniques and must have held a discussion with the patient regarding the usage of such techniques prior to surgery. Some Jehovah's Witness may agree on employing some of these techniques. Acute normovolemic hemodilution (ANH) is an autologous blood collection and volume management technique that may have a role in managing Jehovah's Witness patients intraoperatively [7]. The rationale for this technique is that if the hematocrit level is lowered before any blood loss, lower concentration of red blood cells will be lost if there is any hemorrhage. The patient's blood is removed at the time of surgery before any acute blood loss occurs and acellular fluid, either crystalloid or colloid, is used to maintain circulating intravascular volume. It is important to note that some Jehovah's Witness may refuse colloid infusion in which case the only option for ANH would be crystalloid replacement. Normally the blood that has been removed is in continuous circuit with the patient via an outflow and inflow

tubing connected from the patient to the blood collection bag. Given that the blood is in continuous circuit, some Jehovah's Witness patients may decide that this technique does not conflict with their faith.

The intraoperative cell salvage (ICS) is another possibility for volume management in Jehovah's Witness patients. The ICS machine, commonly called a "cell saver," separates, washes, and concentrates collected red blood cells (RBCs) [8]. Just like ANH, the blood that has been removed can also be in continuous circuit with the patient via an outflow and inflow tubing connected from the patient to the cell saver machine. Again, given that the blood is in continuous circuit, some Jehovah's Witness patients may decide that this technique does not conflict with their faith [9].

Once the patient is guided safely through the surgery, steps can be taken to optimize the safest postoperative course. Multiple studies have shown that surgical patients can tolerate an acute drop in hemoglobin, although levels less than 5 g/dL have been associated with increased mortality. The author's overall postoperative approach in managing Jehovah's witness patients are to:

1. Minimize bleeding and blood loss.
2. Optimize physiological tolerance of anemia.
3. Encourage hematopoiesis.

Overall theme in dealing with acute anemia in our postoperative Jehovah's Witness patients is early vigilance and intervention. Early recognition of any bleeding episodes and intervention is crucial in minimizing blood loss. Experienced clinical judgment is crucial to determine whether the patient needs to return to the operating room or whether the bleeding will stop on its own. Jehovah's Witness patients will require a lower threshold for surgical intervention for blood loss compared to those that will accept blood and factors to halt bleeding.

Jehovah's Witness patients are routinely placed in the ICU setting in the early postoperative period for hemodynamic monitoring. The routine use of measures such as heart rate, blood pressure, CVP, and urine output (as long as the patient does not have ESRD) as markers of resuscitation is highly recommended. Antihypertensive medications such as beta-blockers or calcium channel blockers can be employed to keep the blood pressure under control. Crystalloid solutions are used to replete intravascular volume if extreme hypotension and/or tachycardia ensues. If the patient consents to colloids, solutions such as albumin and hetastarch are options for resuscitation and volume repletion. There are downsides to overusing these solutions, such as hemodilution. Balancing the use of these solutions for adequate resuscitation is crucial. Blood substitutes such as hemoglobin-based oxygen carriers (Hemapure) and perfluorocarbon emulsions are under development. Although protocols are in place in select centers for use of Hemapure (HBOC-201 – bovine hemoglobin), this is not FDA approved.

Blood conservation techniques should be extended to the postoperative period. Multiple past studies have shown significant blood losses in the medical/surgical ICUs with prolonged daily phlebotomies. The authors advocate for minimizing daily phlebotomies. Again, the surgeon must use his/her clinical judgment to avoid needless blood draws and only order labs for specific indications. Routine use of blood draws without specific indications may harm the Jehovah's Witness patients and thus violate the principle of maleficence. In addition, the use of pediatric tubes and/or ISTAT devices can minimize blood losses due to blood draws.

Medications are used judiciously in Jehovah's Witness patients. The authors minimize antiplatelet medications (i.e., aspirin, nonsteroidal anti-inflammatory drugs) immediately after surgery. Patients are encouraged to get out of bed and ambulate starting a few hours after coming out of surgery, and anti-embolic stockings and/or sequential compression devices are employed while the patient is in bed for DVT prophylaxis. Chemical DVT prophylaxis is started after ensuring that the patient does not have any ongoing postoperative bleed. There may be some trepidation from the surgeon to start any anticoagulation in these patients. The risk of thromboembolism must be weighed against the risk of bleeding by the sur-

geon. When the risk of complications from thromboembolism becomes higher than the risk of bleed, blood thinners can be started at the optimal time. It is important to emphasize that Jehovah's Witness patients must have access to every medication that routinely is used on a non-Jehovah's Witness patient. Fear of a bleeding complication must not impair the surgeon from using any medications as long as the benefit of that medication is greater than the event of a postoperative bleed.

Any symptomatic decreases in hemoglobin levels are treated with combination of iron, folic acid, vitamin B12, and/or erythropoietin (see Preoperative Strategies section). Any coagulopathies are aggressively treated. Elevation in INR can be treated with vitamin K injections and any platelet dysfunction secondary to uremia can be treated with desmopressin. If the patient is coagulopathic and bleeding, 4-factor prothrombin complex (Kcentra™) or factor VII can be given, as long as those agents are approved by the patient during informed consent. Other injectable agents such as ε-aminocaproic acid and tranexamic acid are also options although very few studies exist regarding their use in Jehovah's Witness patients in the setting of postoperative bleeding after complex GI surgeries.

Meticulous planning, excellent surgical technique, and early vigilance are the keys to minimizing blood loss and complications in Jehovah's Witness patients. Surgeons are ethically bound under the nonmaleficence clause to provide abundant expertise and resources to ensure that the patient has this level of care.

Justice

Justice refers to the physician's obligation to equally disperse health-care resources to all individuals regardless of religion, sex, creed, ethnicity, or other differences. In the contexts of Jehovah's Witness patients, it is legally and morally wrong for the surgeon to deny any surgical intervention solely due to the religious beliefs of that patient. Even if the patient has specific clause in their religious tenet that forbids them from receiving blood products, withholding care to these individuals is against the ethical that the surgeon must abide by. If the surgeon has the technical ability to perform the procedure in question with minimal blood loss, has the resources around to provide adequate perioperative care and has fully informed the patient on the risks of that procedure, and has gained the approval and trust of that patient, the surgeon has the moral obligation to perform that procedure in the safest manner possible. This tenant is specifically challenged when a surgeon is faced with performing a procedure that has minimal chance of blood loss in a Jehovah's Witness patient: for example, if the patient requires inguinal hernia repair and the surgeon is an experienced groin hernia surgeon. In this circumstance, the surgeon has to ask themselves if they are withholding care simply because of the Jehovah's Witness status of the patient and whether this is a violation of the Justice clause.

It must be emphatically noted that this obligation is different from a surgeon who honestly confesses due to legitimate reason(s) (lack of expertise in that field, lack of operative experience, lack of resources to adequately provide safe perioperative care, etc.) that it is not safe for the patient to receive surgical care with that particular surgeon. Such declaration shows high moral fiber and maturity on the part of the surgeon to admit his/her deficiency as an act of beneficence and nonmaleficence for the patient. In such a case, a frank discussion with the patient that encompasses but does not trespass the limits of the surgeon's expertise should be held. Then the surgeon should provide honest admission of his/her limitations and a plan of referring or transferring the patient to a center with the expertise and the resources for the patient to be properly taken care of.

Concluding Remarks

- The relationship between the surgeon and their patient is like no other relationship.
- The decision to perform surgery on a patient that puts them at higher risk for complications solely based on religious belief is a challenge.
- The surgeon must examine the impact on themselves and on the patient when making the difficult decision to proceed with surgery.

- The surgeon must be both skilled technically and medically and must be knowledgeable about all aspects of perioperative blood conservation when treating the Jehovah's Witness patient.
- The surgeon must decide honestly if their decision to not treat a Jehovah's Witness patient is based on inherent bias rather than hard data. Only he or she can answer that question.

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