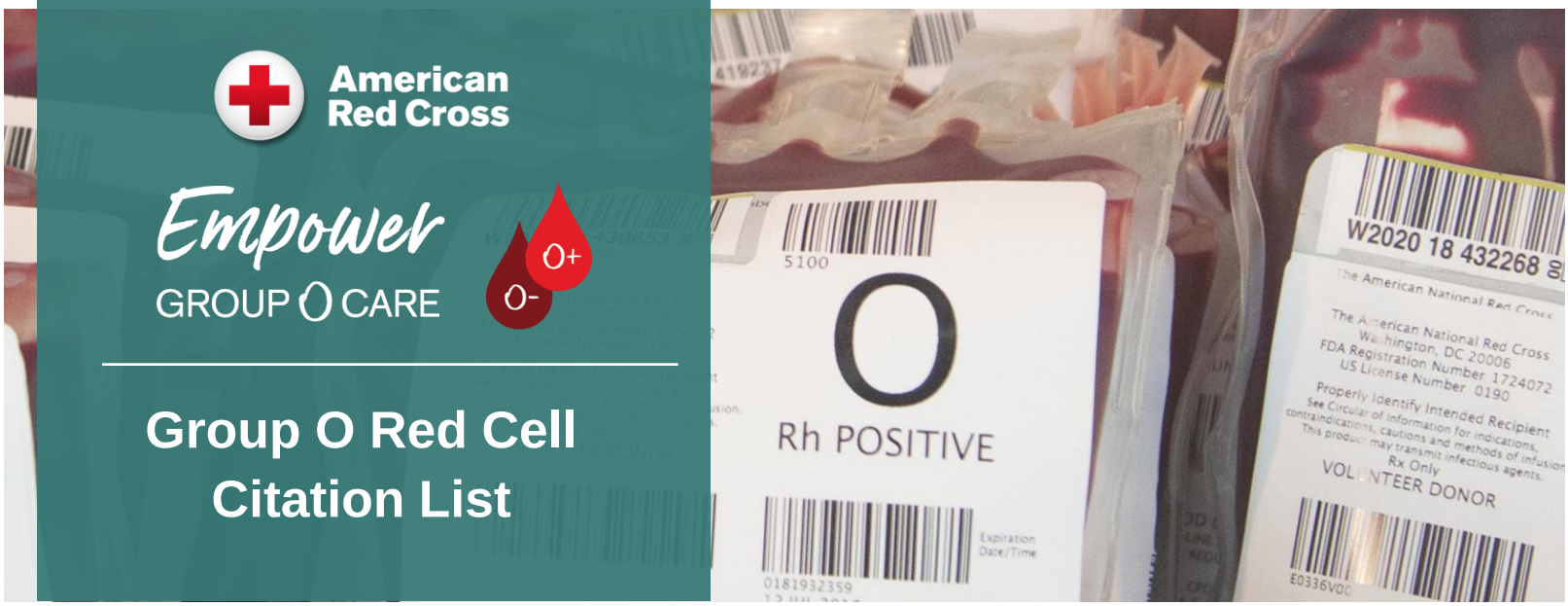

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Providing red blood cells to facilitate organ transplant via normothermic perfusion techniques: A single-center experience

Year: 2024 | **Authors**: E. S. Allen; L. D. Stephens; N. Weber; A. L. Brubaker; K. Hudson; V. Pretorius; G. Schnickel; P. M. Kopko

Journal: Transfusion | **Issue**: 64 | **Pages**:1899-1908

Abstract: **SEE SECTION 2.3 for discussion of O pos/O neg**Background: Normothermic regional perfusion (NRP) and normothermic machine perfusion (NMP) are organ procurement and transport techniques that can improve organ quality, facilitate longer transport, and reduce postoperative complications, increasing organ availability and improving outcomes. NRP and NMP often require allogeneic red blood cells (RBCs). Our academic transfusion service began providing RBCs to support NRP and NMP for adult heart transplant (HT), orthotopic liver transplant (OLT), and multiorgan transplant (MOT) in August 2020. Methods: This single-center, retrospective study describes the implementation process and analyzes the characteristics of RBC support during the first 3 years of the perfusion programs. Timing and quantity of units issued and used, organ recipient demographics, and transplant outcomes were obtained from transfusion service and electronic medical records. Results: From 2020 to 2023, the transfusion service received 233 requests to support NRP and NMP perfusion cases. Of these, 105 cases resulted in RBC use, and units were returned or discarded in 112 cases. A total of 131 patients received perfusion-facilitated transplants (92 HT, 27 OLT, and 12 MOT). The majority of perfusion-facilitated HTs utilized NRP (81/92, 88%), whereas most perfusion-facilitated OLTs utilized NMP (21/27, 78%). Across all 233 requests, a total of 381 RBC units were used to facilitate 131 transplants, averaging 2.91 units/transplant. Discussion: Provision of RBCs for NRP and NMP techniques represents a novel method for transfusion services to support and facilitate life-saving organ transplants with only modest product use, about three RBC units per organ transplant in this single-center study.

URL: https://www.ncbi.nlm.nih.gov/pubmed/39180488

Doi: 10.1111/trf.17994

Pretransfusion testing and transfusion of uncrossmatched erythrocytes

Year: 2015 | **Authors**: M. L. Bisen; R. A. Collins; M. H. Yazer; J. H. Waters

Journal: Anesthesiology | **Issue**: 122 | **Pages**:191-195

Abstract: **See Table 3 for review of studies evaluating risk of non-ABO hemolytic reaction after emergency uncrossmatched transfusion** In Brief: Pretransfusion testing is reviewed for the anesthesiologist, with an emphasis on the electronic crossmatch and transfusion of uncrossmatched erythrocytes when testing is incomplete.

URL: https://journals.lww.com/anesthesiology/fulltext/2015/01000/pretransfusion_testing_and_transfusion_of.32.aspx

Doi: 10.1097/ALN.0000000000000414

Survey of policies at US hospitals on the selection of RhD type of low-titer O whole blood for use in trauma resuscitation

Year: 2024 | **Authors**: S. Clayton; C. M. Leeper; M. H. Yazer; P. C. Spinella

Journal: Transfusion | **Issue**: 64 Suppl 2 | **Pages**:S111-S118

Abstract: BACKGROUND: Low-titer group O whole blood (LTOWB) use is increasing due to data suggesting improved outcomes and safety. One barrier to use is low availability of RhD-negative LTOWB. This survey examined US hospital policies regarding the selection of RhD type of blood products in bleeding emergencies. STUDY DESIGN AND METHODS: A web-based survey of blood bank directors was conducted to determine their hospital's RhD-type selection policies for blood issued for massive bleeding. RESULTS: There was a 61% response rate (101/157) and of those responses, 95 were complete. Respondents indicated that 40% (38/95) use only red blood cells (RBCs) and 60% (57/95) use LTOWB. For hospitals that issue LTOWB (N = 57), 67% are supplied only with RhD-positive, 2% only with RhD-negative, and 32% with both RhD-positive and RhD-negative LTOWB. At sites using LTOWB, RhD-negative LTOWB is used exclusively or preferentially more commonly in adult females of childbearing potential (FCP) (46%) and pediatric FCP (55%) than in men (4%) and boys (24%). RhD-positive LTOWB is used exclusively or preferentially more commonly in men (94%) and boys (54%) than in adult FCP (40%) or pediatric FCP (21%). At sites using LTOWB, it is not permitted for adult FCPs at 12%, pediatric FCP at 21.4%, and boys at 17.1%. CONCLUSION: Hospitals prefer issuing RhD-negative LTOWB for females although they are often ineligible to receive RhD-negative LTOWB due to supply constraints. The risk and benefits of LTOWB compared to the rare occurrence of hemolytic disease of the fetus/newborn (HDFN) need further examination in the context of withholding a therapy for females that has the potential for improved outcomes.

URL: https://www.ncbi.nlm.nih.gov/pubmed/38501231

Doi: 10.1111/trf.17789

Risk of hemolytic transfusion reactions following emergency-release RBC transfusion

Year: 2010 | **Authors**: P. P. Goodell; L. Uhl; M. Mohammed; A. A. Powers

Journal: Am J Clin Pathol | **Issue**: 134 | **Pages**:202-6

Abstract: Group O RBCs are typically issued for urgent transfusions to avoid ABO-incompatible hemolytic transfusion reactions (HTRs). Identification of other clinically significant alloantibodies requires an antibody detection test, and emergency release (ER) of RBCs before its completion carries a risk of non-ABO alloantibody-mediated HTRs. We performed a retrospective review of 1,002 ER RBC transfusions involving 265 ER episodes (262 recipients) in a tertiary medical center, 2006-2008, to determine the risk of non-ABO alloantibody-mediated HTRs. A positive antibody detection test was found in 29 (10.9%) of 265 ER episodes, with clinically significant alloantibodies in 17 (6.4%) of 265 ER episodes. Fifteen antigen-incompatible RBC units were transfused to 7 recipients with clinically significant alloantibodies; 1 transfusion was followed by an HTR. Based on our study, transfusion of ER RBCs before completion of routine blood bank testing carries a low risk of non-ABO alloantibody-mediated HTRs (1/265 [0.4% ER episodes]) and receipt of antigen-incompatible RBCs (7/265 [2.6% ER episodes]).

URL: https://www.ncbi.nlm.nih.gov/pubmed/20660321

Doi: 10.1309/AJCP9OFJN7FLTXDB

Rh immune globulin immunoprophylaxis after RhD-positive red cell exposure in RhD-negative patients via transfusion: A survey of practices

Year: 2024 | **Authors**: W. Lu; L. Stephens; A. Shmookler; K. O'Brien; J. Katz Karp; D. Hermelin; S. Bakhtary; N. Almozain; M. George; M. Fung

Journal: Transfusion | **Issue**: 64 | **Pages**:839-845

Abstract: Background: Current Association for the Advancement of Blood & Biotherapies (AABB) standards require transfusion services to have a policy on Rh immune globulin (RhIG) immunoprophylaxis for when RhD-negative patients are exposed to RhD-positive red cells. This is a survey of AABB-accredited transfusion services in the United States (US) regarding institutional policies and practices on RhIG immunoprophylaxis after RhD-negative patients receive RhD-positive (i.e., RhD-incompatible) packed red blood cell (pRBC) and platelet transfusions. Results: Approximately half of the respondents (50.4%, 116/230) have policies on RhIG administration after RhD-incompatible pRBC and platelet transfusions, while others had policies for only pRBC (13.5%, 31/230) or only platelet (17.8%, 41/230) transfusions, but not both. In contrast, 18.3% (42/230) report that their institution has no written policies on RhIG immunoprophylaxis after RhD-incompatible transfusions. Most institutions (70.2%, 99/141) do not have policies addressing safety parameters to mitigate the risk of hemolysis associated with the high dose of RhIG required to prevent RhD alloimmunization after RhD-incompatible pRBC transfusions. Discussion: With approximately half of US AABB-accredited institutions report having policies on RhIG immunoprophylaxis after both RhD-incompatible pRBC and platelet transfusions, some institutions may not be in compliance with AABB standards. Further, most with policies on RhIG immunoprophylaxis after RhD-incompatible pRBC transfusion do not have written safeguards to mitigate the risk of hemolysis associated with the high dose of RhIG required. Conclusion: This survey underscores the diverse and inadequate institutional policies on RhIG immunoprophylaxis after RhD exposure in Rh-negative patients via transfusion. This observation identifies an opportunity to improve transfusion safety.

URL: https://www.ncbi.nlm.nih.gov/pubmed/38534065/

Doi: 10.1111/trf.17812

Conservation of Rh negative Low Titer O Whole Blood (LTOWB) and the need for a national conversation to define its use in trauma transfusion protocols

Year: 2021 | **Authors**: M. Troughton; P. P. Young

Journal: Transfusion | **Issue**: 61 | **Pages**:1966-1971

Abstract: Low-titer group O whole blood (LTOWB) use is growing steadily in the United States. Although the percentage of O negative LTOWB use by Red Cross hospitals has remained steady at ~23% over the last 2 years, this elevated use rate is twice that of O negative RBC components. Given the more restricted group O donor pool, this level of use will make it difficult to expand the use of this product. Evaluation of hospital practices regarding females of childbearing potential show significant variability with some hospitals transfusing O positive, with others choosing to restrict this population to O negative LTOWB or only O negative RBC component therapy. To ensure access of LTOWB to all patients who may benefit and to maintain sufficient supplies, we recommend developing standardized practice recommendations for its use.

URL: https://www.ncbi.nlm.nih.gov/pubmed/33780020

Doi: 10.1111/trf.16380

(LTOWB) and the need for a national conversation to define its use in trauma transfusion protocols

Year: 2024	**Authors**: J. R. Malone	
Journal: Transfusion	**Issue**: 64 Suppl 2	**Pages**:S4-S10

Abstract: BACKGROUND: Prehospital and early in-hospital use of low titer group O whole blood (LTOWB) for life-threatening bleeding has been independently associated with improved survival compared to component therapy. However, when RhD-positive blood products are administered to RhD-negative females of childbearing potential (FCP), there is a small future risk of hemolytic disease of the fetus and newborn (HDFN). This raises important ethical questions that must be explored in order to justify the use of RhD-positive blood products, including LTOWB, both in clinical practice and research. METHODS: This essay explores the ethical challenges related to RhD-positive blood product administration to RhD-negative or RhD-unknown FCPs as a first-line resuscitation fluid in the trauma setting. These ethical issues include: issues related to decision-making, ethical analysis based on the doctrine of double effect (DDE), and attendant obligations incurred by hospitals that administer RhD-positive blood to FCPs. RESULTS: Ethical analysis through the use of the DDE demonstrates that utilization of RhD-positive blood products, including LTOWB, in the early resuscitation of FCPs is an ethically appropriate approach. By accepting the risk of HDFN, hospitals generate obligations to promote blood donation, evaluate for alloimmunization and counsel patients on the future risk of HDFN, and maintain an understanding of the ethical rationale for RhD-positive blood transfusion.

URL: https://www.ncbi.nlm.nih.gov/pubmed/38491917

Doi: 10.1111/trf.17787

The risk to future pregnancies of transfusion Rh(D)-negative females of childbearing potential with Rh(D)-positive red blood cells during trauma resuscitation is dependent on their age at transfusion

Year: 2021	**Authors**: J. N. Seheult; M. N. Stram; T. Pearce; C. B. Bub; S. P. Emery; J. Kutner; N. Watanabe-Okochi; J. L. Sperry; M. Takanashi; D. J. Triulzi; M. H. Yazer	
Journal: Vox Sang	**Issue**: 116	**Pages**:831-840

Abstract: BACKGROUND: A risk assessment model for predicting the risk of haemolytic disease of the fetus and newborn (HDFN) in future pregnancies following the transfusion of Rh(D)-positive red blood cell (RBC)-containing products to females of childbearing potential (FCP) was developed, accounting for the age that the FCP is transfused in various countries. METHODS: The HDFN risk prediction model included the following inputs: risk of FCP death in trauma, Rh(D) alloimmunization rate following Rh(D)-positive RBC transfusion, expected number of live births following resuscitation, probability of carrying an Rh(D)-positive fetus, the probability of HDFN in an Rh(D)-positive fetus carried by an alloimmunized mother. The model was implemented in Microsoft R Open, and one million FCPs of each age between 18 and 49 years old were simulated. Published data from eight countries, including the United States, were utilized to generate country-specific HDFN risk estimates. RESULTS: The risk predictions showed similar characteristics for each country in that the overall risk of having a pregnancy affected by HDFN was higher if the FCP was younger when she received her Rh(D)-positive transfusion than if she was older. In the United States, the overall risk of HDFN if the FCP was transfused at age 18 was 3.4% (mild: 1.20%, moderate: 0.45%; severe: 1.15%; IUFD: 0.57%); the risk was approximately 0% if the FCP was 43 years or older at the time of transfusion. CONCLUSION: This model can be used to predict HDFN outcomes when establishing transfusion policies as it relates to the administration of Rh(D)-positive products for massively bleeding FCPs.

URL: https://www.ncbi.nlm.nih.gov/pubmed/33491789

Doi: 10.1111/vox.13065

It is time to reconsider the risks of transfusing RhD negative females of childbearing potential with RhD positive red blood cells in bleeding emergencies

Year: 2019	**Authors**: M. H. Yazer; M. Delaney; H. Doughty; N. M. Dunbar; A. Z. Al-Riyami; D. J. Triulzi; J. F. Watchko; E. M. Wood; V. Yahalom; S. P. Emery	
Journal: Transfusion	**Issue**: 59	**Pages**:3794-3799

Abstract: No abstract available

URL: https://www.ncbi.nlm.nih.gov/pubmed/31625172

Doi: 10.1111/trf.15569

Optimizing O-negative RBC utilization using a data-driven approach

Year: 2020 | **Authors**: M. S. Virk; D. Lancaster; T. Quach; A. Lim; E. Shu; G. Belanger; T. D. Pham

Journal: Transfusion | **Issue**: 60 | **Pages**:739-746

Abstract: Background: O-negative red blood cells (ON-RBC) are a precious resource and the international blood banking community has become increasingly concerned with its inappropriate utilization. AABB recently made several recommendations to address the issue. Solutions must be multifaceted and involve donor centers, blood banks, and clinical departments. From the perspective of a hospital blood bank, it is difficult to rely solely on increased donor recruitment and ubiquitous blood typing of the entire in-patient population. We therefore focused on interventions within the blood bank to optimize inventory and policies to ensure appropriate ON-RBC utilization. Study design and methods: Transfusion data over one year was examined for the rate of out-of-group/inappropriate ON-RBC. Furthermore, we assessed whether that rate was related to product life on the day of transfusion. We also examined our stock inventory levels and how excess inventory can contribute to inappropriate ON-RBC usage. Results: The ON-RBC inventory level was decreased in order to reduce the rate of inappropriate transfusions while maintaining a safe level for optimal patient care. Compared to baseline, our intervention caused ON-RBCs to be transfused earlier in their shelf-life (9.27 vs. 11.15 days from expiration [DFE], p = 0.0012). This reduced the overall rate of inappropriate ON-RBC transfusions (67% vs. 54%, p = 0.0035), approximating 185 units of ON-RBC saved over the course of 6 months. Conclusions: A data-driven approach to optimize stock inventory levels is widely applicable; it can be adopted by numerous institutions to improve utilization and establish a benchmark for the broader blood banking community.

URL: https://www.ncbi.nlm.nih.gov/pubmed/32077488

Doi: 10.1111/trf.15713

Not as D"eadly as once thought - the risk of D-alloimmunization and hemolytic disease of the fetus and newborn following RhD-positive transfusion in trauma"

Year: 2023 | **Authors**: M. H. Yazer; G. Panko; J. B. Holcomb; A. Kaplan; C. Leeper; J. N. Seheult; D. J. Triulzi; P. C. Spinella

Journal: Transfusion | **Issue**: 64 | **Pages**:1784-1790

Abstract: The use of blood products to resuscitate injured and massively bleeding patients in the prehospital and early in-hospital phase of the resuscitation is increasing. Using group O red blood cells (RBC) and low titer group O whole blood (LTOWB) avoids an immediate hemolytic reaction from recipient's naturally occurring anti-A and - B, but choosing the RhD type for these products is more nuanced and requires the balancing of product availability and survival benefit against the risk of D-alloimmunization, especially in females of childbearing potential (FCP) due to the possible future occurrence of hemolytic disease of the fetus and newborn (HDFN). Recent models have estimated the risk of fetal/neonatal death from HDFN resulting from D-alloimmunization of an FCP during her trauma resuscitation at between 0-6.5% depending on her age at the time of the transfusion and other societal factors including trauma mortality, her age when she becomes pregnant, frequency of different RHD genotypes in the population, and the probability that the woman will have children with different fathers; this is counterbalanced by an approximately 24% risk of death from hemorrhagic shock. This review will discuss the different models of HDFN outcomes following RhD-positive transfusion as well as the results of recent surveys where the public was asked about their preferences for urgent transfusion in light of the risks of fetal/neonatal adverse events.

URL: https://www.ncbi.nlm.nih.gov/pubmed/36607150

Doi: 10.1080/16078454.2022.2161215

ABO and Rh(D) phenotype frequencies of different racial/ethnic groups in the United States

Year: 2004 | **Authors**: G. Garratty; S. A. Glynn; R. McEntire for the Retrovirus Epidemiology Donor Study

Journal: Transfusion | **Issue**: 44 | **Pages**:703-706

Abstract: BACKGROUND: Commonly quoted ABO/Rh(D) frequencies in the US are usually from relatively small studies with racial or ethnic categories often judged by name or appearance. STUDY DESIGN AND METHODS: A 10-year demographic database that contained racial or ethnic and ABO/Rh(D) phenotype data on 3.1 million allogeneic and autologous donors giving blood at five blood centers in the US was used to compute ABO and Rh(D) phenotypes in various racial/ethnic groups. The racial or ethnic category was designated by the donor. RESULTS: The highest percentage of Group O was found in Hispanic (56.5%), North American Indian (54.6%), and black non-Hispanic (50.2%) donors. Hispanic and black non-Hispanic donors had a much lower percentage (7.3 and 7.1%, respectively) of Rh– compared to white non-Hispanic donors (17.3%). Group O Rh– and Group B Rh– were found more commonly (8.0 and 1.8%, respectively) in white non-Hispanic donors than in Hispanic (3.9 and 0.7%), black non-Hispanic (3.6 and 1.3%), and Asian (0.7 and 0.4%) donors. CONCLUSIONS: These data confirmed that the highest percentages of ORh+, BRh+/ABRh+, and Rh– are present in Hispanic, Asian, and white non-Hispanic donors, respectively. These are the largest and most accurate data of ABO/Rh(D) phenotype frequencies for the major racial/ethnic donor groups in the US.

URL: https://onlinelibrary.wiley.com/doi/10.1111/j.1537-2995.2004.03338.x

Doi: 10.1111/j.1537-2995.2004.03338.x

Rate of D-alloimmunization in trauma does not depend on the number of RhD-positive units transfused: The BEST collaborative study

Year: 2022	**Authors**: J. N. Seheult; J. Callum; M. Delaney; R. Drake; N. M. Dunbar; S. K. Harm; J. R. Hess; B. P. Jackson; A. Javanbakht; S. A. Moore; M. F. Murphy; J. S. Raval; J. Staves; E. E. Tuott; S. Wendel; A. Ziman; M. H. Yazer	
Journal: Transfusion	**Issue**: 642	**Pages**:S185-S192

Abstract: Background: Evidence indicates the life-saving benefits of early blood product transfusion in severe trauma resuscitation. Many of these products will be RhD-positive, so understanding the D-alloimmunization rate is important. Methods: This was a multicenter, retrospective study whereby injured RhD-negative patients between 18–50 years of age who received at least one unit of RhD-positive red blood cells (RBC) or low titer group O whole blood (LTOWB)during their resuscitation between 1 January, 2010 through 31 December, 2019were identified. If an antibody detection test was performed ≥14 days after the index RhD-positive transfusion then basic demographic information was collected, including whether the patient became D-alloimmunized. The overall D-alloimmunization rate, and the rate stratified by the number of units transfused, were calculated. Results: Data were collected from nine institutions. Five institutions reported fewer than 10 eligible patients each and were excluded. From the remaining four institutions, all from the USA, there were 235 eligible patients; 77 (random effects estimate: 32.7%; 95% CI: 19.1–50.1%) became D-alloimmunized. Three of the institutions reported D-alloimmunization rates ≥38.6%, while the remaining institution's rate was 12.2%. In both random and fixed-effects models, the rate of D-alloimmunization was not significantly different between those who received one RhD-positive unit and those who received multiple RhD-positive units. Conclusion: In this large, multicenter study of injured patients, the overall rate of D-alloimmunization fell within the range previously reported. The rate of D-alloimmunization did not increase as the number of transfused RhD-positive units increased. These data can help to inform RhD type selection decisions.

URL: https://pubmed.ncbi.nlm.nih.gov/35748692/

Doi: 10.1111/trf.16952

Receipt of RhD-positive whole blood for life-threatening bleeding in female children: A survey in alloimmunized mothers regarding minimum acceptable survival benefit relative to risk of maternal alloimmunization to anti-D

Year: 2024	**Authors**: M. R. Sherwood; S. Clayton; C. M. Leeper; M. Yazer; K. J. Moise, Jr.; M. E. Granger; P. C. Spinella	
Journal: Transfusion	**Issue**: 64 Suppl 2	**Pages**:S100-S110

Abstract: BACKGROUND: Low-titer group O whole blood (LTOWB) for treatment of hemorrhagic shock sometimes necessitates transfusion of RhD-positive units due to short supply of RhD-negative LTOWB. Practitioners must choose between using RhD-positive LTOWB when RhD-negative is unavailable against the risk to a female of childbearing potential of becoming RhD-alloimmunized, risking hemolytic disease of the fetus and newborn (HDFN) in future children, or using component therapy with RhD-negative red cells. This survey asked females with a history of red blood cell (RBC) alloimmunization about their risk tolerance of RhD alloimmunization compared to the potential for improved survival following transfusion of RhD-positive blood for an injured RhD negative female child. STUDY DESIGN AND METHODS: A survey was administered to RBC alloimmunized mothers. Respondents were eligible if they were living in the United States with at least one red cell antibody known to cause HDFN and if they had at least one RBC alloimmunized pregnancy. RESULTS: Responses from 107 RBC alloimmmunized females were analyzed. There were 32/107 (30%) with a history of severe HDFN; 12/107 (11%) had a history of fetal or neonatal loss due to HDFN. The median (interquartile range) absolute improvement in survival at which the respondents would accept RhD-positive transfusions for a female child was 4% (1%-14%). This was not different between females with and without a history of severe or fatal HDFN (p = .08 and 0.38, respectively). CONCLUSION: Alloimmunized mothers would accept the risk of D-alloimmunization in a RhD-negative female child for improved survival in cases of life-threatening bleeding.

URL: https://www.ncbi.nlm.nih.gov/pubmed/38563495

Doi: 10.1111/trf.17807

A review of attitudes to urgent RhD-positive transfusions in female patients and the risk for hemolytic disease of the fetus and newborn

Year: 2024	**Authors**: M. H. Yazer; P. C. Spinella; J. B. Holcomb; S. Horvath; M. R. Sherwood; S. P. Emery; J. C. Leonard; C. M. Leeper	
Journal: Transfusion	**Issue**: 65	**Pages**:1784-1790

Abstract: No abstract available

URL: https://www.ncbi.nlm.nih.gov/pubmed/39044601

Doi: 10.1111/trf.17967

RhD-negative red blood cells can be saved during liver transplantation in RhD-negative patients due to low risk of alloimmunization against RhD

Year: 2025	**Authors**: D. Juhl; F. Braun; C. Brockmann; I. Muslolik; T. Bunge-Phillipowski; K. Luckner; S. Gorg; M. Ziemann

Journal: Transfusion	**Issue**: 65	**Pages**: 50-57

Abstract: Background: Transfusion demand is high in liver transplantation (LT), and thus RhD-positive (RhD+) red blood cell concentrates (RBCs) are sometimes given to RhD-negative (RhD-) patients. Due to immunosuppression, these patients rarely produce anti-D. We investigated the rate of anti-D formation in RhD- patients undergoing LT who were transfused with RhD+ RBCs as well as the number of transfused RhD- and RhD+ RBCs. Study Design and Methods: RhD-type and transfusion history of all patients undergoing LT between 2010 and 2023 were reviewed retrospectively. In RhD- patients, who received RhD+ RBCs, the results of antibody screening test (indirect antiglobulin test and with papain-treated test cells) and direct antiglobulin test were evaluated. Results: Five hundred and twenty-seven patients underwent 576 LT. Eighty-seven patients were RhD-, of whom 42 were transfused with RhD+ RBCs. In 34 of them, an antibody screening test result was available more than two weeks after the last RhD+ RBCs transfusion. In two of them, a transient, weak anti-D antibody was detectable, which disappeared in the further course. Overall, 1352 RBCs were transfused to the 87 RhD- patients, 543 of those were RhD+. Most RhD+ RBCs were provided to men and elder women. Discussion: Transient weak anti-D occurred in two RhD- male patients during LT after transfusion of RhD+ RBCs without evidence for a hemolytic transfusion reaction. To save stocks of RhD- RBCs, early transfusion of RhD+ RBCs to RhD- men and women beyond the childbearing age should be considered during LT.

URL: https://onlinelibrary.wiley.com/doi/epdf/10.1111/trf.18069

Doi: 10.1111/trf.1806950

RhDAgnosticism: Routine Provision of RhDUnmatched Blood in the Setting of a National Blood Shortage

Year: 2023	**Authors**: Randin Nelson, MD; Jennifer Carver, BS MT (ASCP), Amy Allvord, MLS (ASCP), Lisa DeBlass, BS MT (ASCP), Lisa Young, MT (ASCP), Jennifer Pierson, MT (ASCP), Lane Dixon, MBA MLS (ASCP), Yukiko Sarker, MLS (ASCP) SBB, SH, Adrienne Clark, MT (AAB), Gustaaf de Ridder, MD, PhD

Journal: Poster Presentation AABB Annual Meeting

Abstract: Purpose: Disruptions in the US blood supply during the COVID-19 pandemic have been well-documented, and, to date, the national blood supply continues to experience inventory shortages—particularly a lack of availability of RhD-negative (-) units of all ABO types. During the pandemic, in addition to implementing blood management methods described elsewhere, we began supplying blood for both routine and emergent transfusion in an RhD unmatched fashion. Male patients of any age and female patients above the age of 50 who were RhD(-) were deemed eligible to receive RhD-positive (+) red cell units if they had no history of anti-D. This RhD agnosticism, which is already used widely in trauma resuscitation, was applied to routine transfusion. Methods: We retrospectively audited the blood bank LIS to identify all RhD(-) patients who had received RhD(+) pRBC or Whole Blood (WB) transfusion during the time period the RhD-agnostic policy was put into effect. To determine frequency of RhD alloimmunization among these patients, we limited that set to those who had a repeat antibody screen at least 21 days after the transfusion of RhD positive blood. Of 676 RhD(-) patients who received at least one unit of Rh(+) pRBC or WB, 464 had no follow-up type and screen at time of data analysis, leaving a cohort of 212 patients for whom alloimmunization rate could be calculated (Figure 1). Results: The RhD alloimmunization rate was 21% (41/198) for the non-trauma patients. The RhD alloimmunization rate for trauma patients during the same time period was also 21% (3/14)(Figure 1). A majority (71%) of non-trauma RhD(-) patients who received RhD(+) positive pRBC or WB received only 1 unit (Figure 2). Patients receiving these transfusions had both surgical and non-surgical indications for transfusion (Figure 3). Of note, the medicine (non-oncology) group includes GI bleeds. There were no hemolytic transfusion reactions related to anti-D during this time period. Discussion: Transfusion of RhD(+) red cells to RhD(-) patients receiving routine and emergent non-trauma transfusion yielded an alloimmunization rate of 21%. This is significantly lower than prior RhD alloimmunization rates reported in trauma (roughly 25-40%). These rates are all lower than the traditional teaching that up to 80% of RhD(-) patients will be alloimmunized with a single exposure. It should be noted that RhD(-) females of childbearing age were not eligible to receive routine RhD(+) pRBC transfusion to avoid risk of future development of hemolytic disease of the fetus and newborn (HDFN). Younger RhD(-) females were eligible for emergent RhD(+) transfusions. Future directions include additional characterization of this data set to for outcomes specific to alloimmunization based on dose and patient demographics, rates of non-RhD alloimmunization, and timing of T&S follow-up testing. Experts have previously suggested that RhD-agnostic approaches are reasonable in the setting of blood shortages. In the setting of ongoing post-pandemic challenges with the nation's blood supply, it is vital for the transfusion community to reassess the risks of alloimmunization and identify patient populations that should be eligible for routine RhD-agnostic transfusion. We have pragmatically demonstrated that this approach can be safely implemented.

Poster available upon request.

Releasing Our Grip on O negative PRBCs for Better Utilization

Year: 2024

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Abstract: Purpose: Local and national blood suppliers continue to report critically-low inventory levels for RhD-NEG PRBC, especially universally compatible ABO type O RhD negative (O-NEG) PRBC. Given the continued shortage, decreasing unnecessary use of O-NEG PRBC is essential. Our approach has allowed our far-flung rural-to-urban health system to improve our O-NEG utilization. Since the onset of the COVID-19 pandemic, Geisinger Health significantly restricted indications for RhD negative (RhD-NEG) packed red blood cell (PRBC) transfusion. We consider clinical indications for RhD-NEG PRBC as: patients who are at risk of developing hemolytic disease of the fetus and newborn (HDFN), those who have anti- D alloantibody, and specific at-risk populations for whom anti-D would complicate their transfusion management—such as stem cell transplant and sickle cell disease patients. We report on our ongoing efforts. Methods: We reviewed utilization of O-NEG PRBC for the calendar year of 2023 to determine adherence to our RhD guideline (Figure 1) and the effect on our O-NEG inventory. Results: O-NEG comprised 8% (1580 of 19840) of PRBC units transfused at the 9 Geisinger hospitals in calendar year 2023. We found 21% (327/1580) noncompliance with our RhD-NEG transfusion guidelines. Among the 327 units given against guidelines, 99 O-NEG PRBC units went to RhD-POS individuals in Trauma or Emergency Release where historical types were known or eligible for O-POS PRBC from the start. RhD-NEG individuals who were eligible for RhD-POS transfusions received 228 O-NEG PRBC units (Figure 2). Among the O-NEG units given against guidelines, 124 of 327 were within 7 days of expiration, another 89 units were within 10 days of expiration, and yet another 56 units were within 14 days of expiration (Figure 3). Blood Bank staff at certain sites adjusted their adherence to the guidelines to prevent having O-NEGs that would have to go RhD-POS patients in order not to waste the unit. We also identified 343 O-NEG PRBC given to RhD-POS patients within 5 days of expiry, or 22% (343/1580) of total transfusions of O-NEG PRBC. Discussion: Our baseline 8% overall O-NEG utilization is well below national averages due to ongoing utilization efforts (Figure 4). Despite our internal guidelines existing since May 2020, certain staff remain uncomfortable with the recommendation of giving RhD-POS blood to eligible RhD-NEG individuals. Further educational efforts are warranted. The 21% of our O-NEG utilization that went to RhD-POS patients within 5 days of product expiry is a target for further reduction. We have updated our guidelines regarding short-dated RhD-NEG units to allow issuance to RhD-NEG patients at 14 days prior to expiration (as opposed to 5 days). This change reduce the number of O-NEG PRBCs going to RhD-POS individuals without increasing overall O-NEG utilization.

Poster available upon request.