SMaRT Blood: Single-unit Versus Multiple-unit Packed Red Blood Cell Transfusion in Non-acute Postpartum Anemia

NCT03419780

February 15, 2018

Protocol Details

Basic Info

Confirmation Number:	**cficgcid**
Protocol Number:	**829141**
Created By:	**HAMM, REBECCA F**
Principal Investigator:	**SRINIVAS, SINDHU**
Protocol Title:	**Can a single-unit blood transfusion protocol in obstetrics reduce number of units transfused? A randomized, cont trial**
Short Title:	**SMaRT Blood: Single-unit versus Multiple-unit Packed Red Blood Cell Transfusion in non-acute postpartum anem**
Protocol Description:	**There is a paucity of data on management of non-acute postpartum anemia. Although blood transfusions were historically initiated with 2 units, the most recent recommendation from the American Association of Blood Banks is to begin with 1 unit. As no randomized controlled trials have been performed in obstetrics, we propose a randomized, controlled trial in non-acute postpartum anemia comparing single- versus multiple-unit transfusion by total numbers of units transfused and maternal morbidity.**
Submission Type:	**Biomedical Research**
Application Type:	**FULL**

Resubmission*
Yes

Hospital Sites
Will any research activities and/or services be conducted at a Penn Medicine affiliated hospital site?
No

Study Personnel

Principal Investigator

Name:	**SRINIVAS, SINDHU**
Dept / School / Div:	**4333 - OB-Obstetrics and Gynecology**
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HS Training Completed:	**Yes**
Training Expiration Date:	**04/05/2018**
Name of course completed :	**CITI Protection of Human Subjects Research Training - ORA**

SMaRT Blood: Single-unit Versus Multiple-unit Packed Red Blood Cell Transfusion in Non-acute Postpartum Anemia

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Study Contacts

None

Other Investigator

Name:	**HAMM, REBECCA F**
Dept / School / Div:	**4333 - OB-Obstetrics and Gynecology**
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HS Training Completed:	**Yes**
Training Expiration Date:	**06/16/2019**
Name of course completed :	**CITI Protection of Human Subjects Research Training - ORA**

Responsible Org (Department/School/Division):

4333 - OB-Obstetrics and Gynecology

Key Study Personnel

None

Disclosure of Significant Financial Interests*
Does any person who is responsible for the design, conduct, or reporting of this research protocol have a **FINANCIAL INTEREST**?
No

Penn Intellectual Property*
To the best of the Principal Investigator's knowledge, does this protocol involve the testing, development or evaluation of a drug, device, product, or other type of intellectual property (IP) that is owned by or assigned to the University of Pennsylvania?
No

Certification
I have reviewed the *Financial Disclosure and Presumptively Prohibited Conflicts for Faculty Participating in Clinical Trials* and the *Financial Disclosure Policy for Research and Sponsored Projects* with all persons who are responsible for the design, conduct, or reporting of this research; and all required Disclosures have been attached to this application.
Yes

Biomedical Research

Clinical Trial*
Is this a clinical trial?
Yes

If Yes, please be aware that for each clinical trial conducted or supported by a Federal department or agency, one IRB-approved informed consent form used to enroll subjects must be posted by the awardee or the Federal department or agency component conducting the trial on a publicly available Federal Web site that will be established as a repository for such informed consent forms.

Investigator Initiated Trial*
Is this an investigator initiated trial?
Yes

If Yes, please be aware that the investigator may be required to create and manage a record of this trial in https://clinicaltrials.gov.

Drugs or Devices*
Does this research study involve Drugs or Devices?
Yes: Drugs, products or devices are used in accordance with FDA approval.

IND Exemption

For studies that fall under an IND exemption, please provide the number below

For studies including IND or IDE's, please provide the number(s) below

IDE Review*
NOTE: For research involving investigational devices, you are required to review the guidance on Managing Research Device Inventory. Consult the Penn Manual for Clinical Research: https://www.med.upenn.edu/pennmanual/secure/investigational-product-management-at-sites-not-using-investigational-drug-services-(ids).html Please check the box Yes if you have reviewed the guidance.
Yes

Research Device Management*
Please indicate how research device(s) will be managed.
Not Applicable (no investigational devices)

Drug, Herbal Product or Other Chemical Element Management *
Please indicate how drugs, herbal products or other chemical entities will be managed.
Not Applicable (no drugs, herbal products or other chemical entities)

Radiation Exposure*
Are research subjects receiving any radiation exposure (e.g. X-rays, CT, Fluoroscopy, DEXA, pQCT, FDG, Tc-99m, etc.) that they would not receive if they were not enrolled in this protocol?
No

Gene Transfer*
Does this research involve gene transfer (including all vectors) to human subjects?
No

Human Source Material*
Does this research include collection or use of human source material (i.e., human blood, blood products, tissues or body fluids)?
No

CACTIS and CT Studies*
Does the research involve Center for Advanced Computed Tomography Imaging Services (CACTIS) and CT studies that research subjects would not receive if they were not part of this protocol?
No

CAMRIS and MRI Studies*
Does the research involve Center for Advanced Magnetic Resonance Imaging and Spectroscopy (CAMRIS) and MRI studies that research subjects would not receive if they were not part of this

protocol?
No

Investigational Agent or Device within the Operating Room*
Does the research project involve the use of an investigational agent or device within the Operating Room?
No

Cancer Related research not being conducted by an NCI cooperative group*
Does this protocol involve cancer-related studies in any of the following categories?
No

Processing of Materials*
Will the research involve processing (such as over encapsulating, or compounding)?
No

In-House Manufacturing of Materials*
Will the research involve processing (such as over encapsulating, or compounding)?
No

Medical Information Disclosure*
Does the research proposal involve the use and disclosure of research subject's medical information for research purposes?
Yes

If the answer is YES, indicate which items is is provided with this submission:

Modified research informed consent document that incorporates HIPAA requirements

CTRC Resources*
Does the research involve CTRC resources?
No

Pathology and Laboratory Medicine Resources*
Will samples be collected by hospital phlebotomy and/or processed or analyzed by any of the clinical laboratories of the University of Pennsylvania Health System?
No

Research Involves Apheresis, Cell Collection, and/or Blood Product Collection*
Does this research involve collection of blood products in the Penn Donor Center and/or the use of apheresis for treatment or collection of cells or other blood components?
No

Research involving blood transfusion or drug infusions*
Will your research involve blood transfusion or infusion of study drug in 3 Ravdin Apheresis Unit for research purposes?
No

Trial in Radiation Oncology
Is this research a prospective trial being done in Radiation Oncology, and if so, has this protocol been approved by the Radiation Oncology Protocol committee?
N/A

Study in Radiation Oncology
Is this research a retrospective study being done in Radiation Oncology, and if so, has this project been reviewed by the Radiation Oncology Clinical Research Group?
N/A

Use of UPHS services*
Does your study require the use of University of Pennsylvania Health System (UPHS) services, tests or procedures*, whether considered routine care or strictly for research purposes?
No

Primary Focus*
Clinical Trial (prospectively assigning subjects to health-related interventions to evaluate outcomes)

Protocol Interventions

	Sociobehavioral (i.e. cognitive or behavioral therapy)
x	**Drug**
	Device - therapeutic
	Device - diagnostic (assessing a device for sensitivity or specificity in disease diagnosis)
	Surgical
	Diagnostic test/procedure (research-related diagnostic test or procedure)
	Obtaining human tissue for basic research or biospecimen bank
	Survey instrument
	None of the above

The following documents are currently attached to this item:

There are no documents attached for this item.

Sponsors

Business Administrator

none

Department budget code

000 - 000 - 0 - 000000 - 0000 - 0000 - 0000

Funding Sponsors

Funding sponsors billing address
If you have selected a commercial or industry sponsor, please provide the appropriate address and contact information for the Sponsor for the purposes of billing for IRB review fees (initial review, continuing review and convened modification fees apply here). If the Sponsor is not industry/ commercial, this information is not necessary to provide with your application.

Funding sponsors gift
Is this research being funded by a philanthropic gift?

Regulatory Sponsor

IND Sponsor

none

000 - 000 - 0 - 000000 - 0000 - 0000 - 0000

Industry Sponsor

None

Project Funding*
Is this project funded by or associated with a grant or contract?
No

Sponsor Funding
Is this study funded by an industry sponsor?

Status of contract

The following documents are currently attached to this item:

There are no documents attached for this item.

Multi-Site Research

Other Sites

No other sites

Management of Information for Multi-Center Research

The following documents are currently attached to this item:

There are no documents attached for this item.

Protocol

Abstract
Postpartum hemorrhage (PPH), which accounts for 30% of all direct maternal deaths, is the single most important cause of maternal morbidity and mortality across the globe and is a focus of attention of national organizations such as the Council for Patient Safety in Womens Health in recent years. Yet, there remains a paucity of data on the appropriate management of non-acute postpartum anemia. It is common practice in obstetrics to offer a transfusion of packed red blood cells (pRBCs) to women with a hemoglobin (Hb) value less than 7 g/dL (hematocrit less than 20%) and to symptomatic women with even higher hemoglobin levels. Although transfusions were historically initiated with 2 units of pRBCs, the most recent recommendation from the American Association of Blood Banks (AABB) for a stable patient is to begin with 1 unit and reassess. However, while surgical data has successfully demonstrated that liberal blood transfusion increases morbidity and mortality in comparison to restricted transfusion, no randomized controlled trials have been performed in obstetrics to demonstrate superiority of a single-unit transfusion protocol. We propose a randomized, controlled trial in non-acute postpartum anemia comparing single-unit versus multiple-unit transfusion by total numbers of units transfused and maternal morbidity with the hypothesis that single-unit transfusions can reduce the number of units transfused without increasing maternal morbidity.

Objectives

Overall objectives
We propose a randomized, controlled trial in non-acute postpartum anemia comparing single-unit versus multiple-unit transfusion by total numbers of units transfused and maternal morbidities.

Primary outcome variable(s)
To determine if a single-unit pRBC transfusion protocol in non-acute postpartum anemia can reduce total number of units transfused compared to a multiple-unit pRBC transfusion protocol.

Secondary outcome variable(s)
To determine if there is a difference between single-unit and multiple-unit transfusion protocols in maternal morbidity, including postpartum infections, length of stay, and transfusion reactions. To determine if there is a difference between single-unit and multiple-unit transfusion protocols in breastfeeding rates at hospital discharge and 6 weeks postpartum. To determine if there is a difference between single-unit and multiple-unit transfusion protocols in Edinburgh Postnatal Depression Scale, Multidimensional Fatigue Inventory, and Maternal Attachment Inventory score at 6 weeks postpartum.

Background

Postpartum hemorrhage (PPH), which accounts for 30% of all direct maternal deaths, is the single most important cause of maternal morbidity and mortality across the globe (1) and is a focus of attention of national organizations such as the Council for Patient Safety in Womens Health in recent years. Yet, there remains a paucity of data on the appropriate management of non-acute postpartum anemia. Packed red blood cells (pRBC) transfusion may be a lifesaving treatment for acute hemorrhage, but it is also widely used after PPH for non-acute, stable anemia (2). Postpartum anemia is associated with clinical consequences including fatigue and symptoms of depression (3,4). A low postpartum hemoglobin (Hb) is the most important commonly cited reason to prescribe RBC transfusions (5). The indication for RBC transfusion, however, is not to increase postpartum Hb level, but to reduce morbidity and improve the health-related quality of life. It is common practice in obstetrics to offer a transfusion of pRBCs to women with a Hb value less than 7 g/dL (hematocrit less than 20%) and to symptomatic women with even higher hemoglobin levels (2). Transfusions were historically initiated with 2 units of pRBCs, and this remains the case on many labor and delivery units across the country, including at the Hospital of the University of Pennsylvania. However, there is increasing concern about adverse effects and costs of current transfusion practice. The most recent recommendation from the American Association of Blood Banks (AABB) for a stable patient is to begin with 1 unit and reassess (6). The American College of Obstetricians and Gynecologists, in the newly released 2017 practice bulletin on postpartum hemorrhage, has included the AABBs statement, endorsing the use of single-unit transfusion (7). While surgical data has successfully demonstrated that liberal blood transfusion increases morbidity and mortality in comparison to restricted transfusion (8), no trials have been performed in obstetrics to demonstrate superiority of a single-unit transfusion protocol. In addition, a qualitative study in Australia looking at provider practice and perception regarding single- versus multiple- unit transfusion protocols after a similar national recommendation demonstrated wide variation. To some providers, single-unit transfusions had lower perceived utility and multiple-unit transfusions were perceived to improve maternal-infant bonding and infectious outcomes. In contrast, others believed that single-unit transfusions reduced infection and transfusion reaction risk while having the same desired efficacy (9).

Study Design

Phase*

Not applicable

Design

General Design: A randomized, controlled trial in non-acute postpartum anemia comparing single-unit versus multiple-unit transfusion by total numbers of units transfused. Allocation to Interventional Group: Subjects will be randomized to either single-unit versus multiple-unit transfusion protocols. Subjects will be randomized in a one to one fashion and the randomization will take place using a computer-generated algorithm. Study Measures 1. The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-report scale designed to screen for postnatal depression. It has been validated in large, diverse populations over the last 30 years (10-11). The scale can be completed in about 5 minutes and has a simple method of scoring. It has a score that ranges from 0 to 30. Mothers will be considered to have possible postpartum depression (PPD) when the EPDS score is 11. The cutoff will be set at 11, as studies have shown this cutoff to maximize the sensitivity and specificity in detecting PPD to 100 and 92 %, respectively (12). 2. The Multidimensional Fatigue Inventory (MFI) evaluates five dimensions of fatigue: general fatigue, physical fatigue, reduced activity, reduced motivation and mental fatigue. The MFI has previously been evaluated in a postpartum population, where the findings demonstrated a significant correlation between hemoglobin and physical fatigue score (13). The MFI consists of 20 statements for which the participant indicates, on a 5-point scale, the extent to which the particular statement applies with regard to aspects of fatigue experienced during the previous days. Higher scores indicate a higher degree of fatigue. The minimum clinically relevant difference for the MFI has not been established for women in the puerperium. 3. The Maternal Attachment Inventory (MAI) was developed to measure maternal affectionate attachment (14). This is the unique, affectionate relationship that develops between a woman and her infant. It consists of 26 items, organized into a four-point Likert scale. t. The lowest score is 26, and the highest is 104. Higher scores indicate greater attachment between mother and baby. Primary Study Endpoint: The primary study endpoint will be a reduction in number of blood products used per person from 1.9 to 1.75 with a SD of 0.5.

Study duration
In order to determine our expected sample size, we assessed our baseline data (15). During this time period, the culture at our institution was that if the decision was made to proceed with transfusion, generally 2 units of pRBCs were given. Over a 3 month period in 2015, 612 patients delivered, of which 30 received pRBC transfusions (4.9%). 11 of these transfusions occurred prior to the 12 hour blood count, which may indicate a more acute need for transfusion. Some of those patients may have also received additional units in the non-acute setting after stabilization and thus would still qualify to participate in this study. In the whole group of transfused patients, a total of 74 units of pRBCs were transfused, at an average of 2.5 units per person transfused. Excluding those transfused in the first 12 hours postpartum, 36 units of pRBCs were transfused among 19 patients at an average of 1.9 units per person transfused (with a standard deviation [SD] of 0.3). Thus, over one year, we would expect to see approximately 72 patients requiring non-acute postpartum transfusion. Our expected sample size to have 80% power to demonstrate a reduction in number of blood products used per person from 1.9 to 1.68 with a SD of 0.5, assuming an alpha of 5%, would be 33 patients per group. If 50% of patients agreed to participate, we estimate it will take 2 years to achieve this sample size. We then expect it will take an additional year to analyze and publish our data. For each study participant, they will be involved in the study from the time of consent until their 4-9 week postpartum visit. In order to reduce burden to patients, we plan to combine our postpartum survey instruments with the routine postpartum visit.

Resources necessary for human research protection
Describe research staff and justify that the staff are adequate in number and qualifications to conduct the research. Describe how you will ensure that all staff assisting with the research are adequately informed about the protocol and their research related duties. Please allow adequate time for the researchers to conduct and complete the research. Please confirm that there are adequate facilities for the research.
Given we expect to enroll approximately 3 patients per month, the overall burden on the research staff is minimal. Consent and randomization will be performed by the primary investigators as well as trained housestaff who are generally responding to the need for transfusion. 1-2 training sessions will occur prior to the beginning of study to adequately train involved housestaff for the consenting process and the research protocol. Ongoing educational modules will take place throughout the course of the study and additional training sessions will occur to address housestaff turnover.

Characteristics of the Study Population

Target population
We would include nonacute postpartum women (defined as 6 hours after delivery) who have been determined to require blood transfusion either by Hb 7g/dL, or 7g/dL with signs or symptoms of anemia such as fatigue, dizziness, tachycardia, or hypotension.

Subjects enrolled by Penn Researchers
66

Subjects enrolled by Collaborating Researchers
0

Accrual
We plan to recruit admitted postpartum patients at the time a provider makes the decision that they require a nonacute blood transfusion. In order to determine our expected sample size, we assessed our baseline data (15). During this time period, the culture at our institution was that if the decision was made to proceed with transfusion, generally 2 units of pRBCs were given. Over a 3 month period in 2015, 612 patients delivered, of which 30 received pRBC transfusions (4.9%). 11 of these transfusions occurred prior to the 12 hour blood count, which may indicate a more acute need for transfusion. Some of those patients may have also received additional units in the non-acute setting after stabilization and thus would still qualify to participate in this study. In the whole group of transfused patients, a total of 74 units of pRBCs were transfused, at an average of 2.5 units per person transfused. Excluding those transfused in the first 12 hours postpartum, 36 units of pRBCs were transfused among 19 patients at an

average of 1.9 units per person transfused (with a standard deviation [SD] of 0.3). Thus, over one year, we would expect to see approximately 72 patients requiring non-acute postpartum transfusion. Our expected sample size to have 80% power to demonstrate a reduction in number of blood products used per person from 1.9 to 1.68 with a SD of 0.5, assuming an alpha of 5%, would be 33 patients per group.

Key inclusion criteria
Women over 18 Willing and stable to give consent 6 hours postpartum from any mode of delivery Determined by their physician to require blood transfusion either by: o Hb 7g/dL OR o 7g/dL with any sign or symptom of anemia such as fatigue, dizziness, tachycardia, or hypotension Agreed to accept blood transfusion No contraindications to blood transfusion

Key exclusion criteria
We plan to exclude: 1. Patients with hemoglobinopathies 2. Patients with an ejection fraction 35% 3. Patients presenting with heart rate of greater than 130 bpm and/or blood pressure readings of less than 80/40 mm Hg. 4. Patients whose clinicians determine that they do not require transfusion. 5. Patients whose clinicians determine that they will definitely require 2 units. 6. Patients who present with hemoglobin levels of less than 5g/dL.

Vulnerable Populations

	Children Form
	Pregnant women (if the study procedures may affect the condition of the pregnant woman or fetus) Form
	Fetuses and/or Neonates Form
	Prisoners Form
	Other
x	**None of the above populations are included in the research study**

The following documents are currently attached to this item:

There are no documents attached for this item.

Populations vulnerable to undue influence or coercion
Informed consent will be obtained without coercion and all patients approached will be treated equally. The Maternal Child Health Research Program works to ensure that studies do not compete for participants and that the patient experience on labor and delivery is not negatively impacted by the research agenda. Penn students or employees approached to consent will be informed that their decision whether or not to participate will in no way impact their standing at the university.

Subject recruitment
We plan to recruit admitted postpartum patients at the time a provider makes the decision that they require a nonacute blood transfusion. If a provider determines a patient is a candidate for a nonacute blood transfusion: Step 1: Provider informs patient of recommendation for pRBC transfusion. Sample: We feel that, given your blood count [and/or symptoms], a blood transfusion will help you feel and heal better. However, we dont know whether one or two units is the right amount of blood for a postpartum patient and we are currently doing a study here to figure that out. Would you be willing to speak to our coordinator about the study? Step 2: Inform research staff/provider about potential patient, who will approach the patient for consent at that time. If she consents, she will be randomized at the same time. In order to ensure timely treatment, a time limit for consent and randomization from the time a provider deems a patient requires transfusion will be set at 6 hours.

Will the recruitment plan propose to use any Penn media services (communications, marketing, etc.) for outreach via social media avenues (examples include: Facebook, Twitter, blogging, texting, etc.) or does the study team plan to directly use social media to recruit for the research?
No

The following documents are currently attached to this item:

There are no documents attached for this item.

Subject compensation*
Will subjects be financially compensated for their participation?
Yes

The following documents are currently attached to this item:

There are no documents attached for this item.

If there is subject compensation, provide the schedule for compensation per study visit or session and total amount for entire participation, either as text or separate document

Through the Council for Patient Safety in Womens Health, the primary investigator won a National Improvement Challenge Award for work in postpartum hemorrhage. This award totaled $3000 designated for future work in this realm. We plan to utilize this funding for patient compensation as a part of this trial. Given we ask the patient to return for a study visit to complete survey data, we plan to compensate patients for the time and effort involved in participating in this study. We plan to provide the patient with $25 on discharge date from delivery hospitalization and $25 at the time of the 4-9 week postpartum End of Study Visit once the survey instruments are complete. This will be provided in the form of a Visa giftcard.

Study Procedures

Suicidal Ideation and Behavior
Does this research qualify as a clinical investigation that will utilize a test article (ie- drug or biological) which may carry a potential for central nervous system (CNS) effect(s)?
No

Procedures
See attached document.

The following documents are currently attached to this item:

Procedures (smartbloodprotocolforirbv2.pptx)

Deception
Does your project use deception?
No

International Research
Are you conducting research outside of the United States?
No

Analysis Plan
Baseline and demographic characteristics will be summarized by standard descriptive statistics (including mean and standard deviation for continuous variables such as age and standard percentages for categorical variables such as gender). We will use T tests to compare number of units transfused between our single-unit and multiple-unit transfusion protocols.

The following documents are currently attached to this item:

There are no documents attached for this item.

Data confidentiality

- x **Paper-based records will be kept in a secure location and only be accessible to personnel involved in the study.**
- x **Computer-based files will only be made available to personnel involved in the study through the use of access privileges and passwords.**

  Prior to access to any study-related information, personnel will be required to sign statements agreeing to protect the security and confidentiality of identifiable information.
- x **Wherever feasible, identifiers will be removed from study-related information.**

  A Certificate of Confidentiality will be obtained, because the research could place the subject at risk of criminal or civil liability or cause damage to the subject's financial standing, employability, or liability.

  A waiver of documentation of consent is being requested, because the only link between the subject and the study would be the consent document and the primary risk is a breach of confidentiality. (This is not an option for FDA-regulated research.)

  Precautions are in place to ensure the data is secure by using passwords and encryption, because the research involves web-based surveys.

  Audio and/or video recordings will be transcribed and then destroyed to eliminate audible identification of subjects.

Subject Confidentiality

Information about study subjects will be kept confidential and managed according to the requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Those regulations require a signed subject authorization informing the subject of the following: What protected health information (PHI) will be collected from subjects in this study Who will have access to that information and why Who will use or disclose that information The rights of a research subject to revoke their authorization for use of their PHI. In the event that a subject revokes authorization to collect or use PHI, the investigator, by regulation, retains the ability to use all information collected prior to the revocation of subject authorization. For subjects that have revoked authorization to collect or use PHI, attempts should be made to obtain permission to collect at least vital status (i.e. that the subject is alive) at the end of their scheduled study period. No subject's identifying information (including but not limited to name, birth date, medical record number, address, phone number, email address, social security number, or photo identification) will be recorded. Instead, each patient will be identified only by a study number. This will be very effective in protecting the identity and other personal information of each patient enrolled. Data will be stored on a password protected and institutionally secured computer in a locked office. Any printed copies will be stored in a locked file cabinet in a locked office. The de-identified data will be used only by those investigators involved in the study. A separate data sheet will link the patient's medical record number to her study number. This list will be kept separate from the database. This information will be stored in a locked file cabinet in a locked office. The principal investigator assures the IRB that this information will not be used after this study without prior IRB approval. This list will be discarded after the database is clean and closed. The data will not be retained or shared with other researchers. The data will not become a part of the subject's permanent record.

Sensitive Research Information*

Does this research involve collection of sensitive information about the subjects that should be excluded from the electronic medical record?
No

Subject Privacy

Privacy refers to the person's desire to control access of others to themselves. Privacy concerns people, whereas confidentiality concerns data. Describe the strategies to protect privacy giving consideration to the following: The degree to which privacy can be expected in the proposed research and the safeguards that will be put into place to respect those boundaries. The methods used to identify and contact potential participants. The settings in which an individual will be interacting with an investigator. The privacy guidelines developed by relevant professions, professional associations and scholarly disciplines (e.g., psychiatry, genetic counseling, oral history, anthropology, psychology).

Potential participants will be identified by their physician and asked if they would be willing to speak with research staff. Only if a patient agrees will they be approached by research staff. Once enrolled in the study, the only contact with research staff will be to schedule the postpartum follow up by telephone.

Data Disclosure
Will the data be disclosed to anyone who is not listed under Personnel?
De-identified data may be released to statistical support staff if needed.

*Data Protection**

x	**Name**
	Street address, city, county, precinct, zip code, and equivalent geocodes
x	**All elements of dates (except year) for dates directly related to an individual and all ages over 89**
x	**Telephone and fax number**
	Electronic mail addresses
	Social security numbers
x	**Medical record numbers**
	Health plan ID numbers
	Account numbers
	Certificate/license numbers
	Vehicle identifiers and serial numbers, including license plate numbers
	Device identifiers/serial numbers
	Web addresses (URLs)
	Internet IP addresses
	Biometric identifiers, incl. finger and voice prints
	Full face photographic images and any comparable images
	Any other unique identifying number, characteristic, or code
	None

Does your research request both a waiver of HIPAA authorization for collection of patient information and involve providing Protected Health Information ("PHI") that is classified as a "limited data set" (city/town/state/zip code, dates except year, ages less than 90 or aggregate report for over 90) to a recipient outside of the University of Pennsylvania covered entity?
No

Tissue Specimens Obtained as Part of Research*
Are Tissue Specimens being obtained for research?
No

Tissue Specimens - Collected during regular care*
Will tissue specimens be collected during regulator clinical care (for treatment or diagnosis)?
No

Tissue Specimens - otherwise discarded*
Would specimens otherwise be discarded?
No

Tissue Specimens - publicly available*
Will tissue specimens be publicly available?
No

Tissue Specimens - Collected as part of research protocol*
Will tissue specimens be collected as part of the research protocol?
No

Tissue Specimens - Banking of blood, tissue etc. for future use*
Does research involve banking of blood, tissue, etc. for future use?
No

Genetic testing
If genetic testing is involved, describe the nature of the tests, including if the testing is predicative or exploratory in nature. If predictive, please describe plan for disclosing results to subjects and provision of genetic counseling. Describe how subject confidentiality will be protected Note: If no genetic testing is to be obtained, write: "Not applicable."
Not applicable.

Consent

1. Consent Process

Overview
All subjects for this study will be provided a consent form describing this study providing sufficient information for subjects to make an informed decision about their participation in this study. See Attachment for a copy of the Subject Informed Consent Form. This consent form will be submitted with the protocol for review and approval by the IRB for the study. The formal consent of a subject, using the IRB-approved consent form, must be obtained before that subject undergoes any study procedure. The subject must sign the consent form, and the investigator-designated research professional obtaining the consent. Subjects will be consented by the study Principal Investigators, or appropriate research staff, in their postpartum inpatient room. The study will be explained in lay person terms to each eligible woman by one of the research staff. The consent form will be given to the woman to review. She will have ample time to read the consent form on her own. She will be asked if she has any questions regarding the study protocol or the consent form. All questions will be answered. The woman will be informed that her care will not be affected if she chooses not to participate in the study and that she may discontinue participation in the study at any time point. The consent document will be signed by both the research subject and the staff member obtaining consent prior to any research activities.

Children and Adolescents
Not applicable.

Adult Subjects Not Competent to Give Consent
In our population, it is unlikely to approach a patient who would be unable to consent. If a patient is unable to provide informed consent as determined by an informal assessment by her provider, she will not be eligible for this study.

2. Waiver of Consent

Waiver or Alteration of Informed Consent*
No Waiver Requested

Minimal Risk*

Impact on Subject Rights and Welfare*

Waiver Essential to Research*

Additional Information to Subjects

Written Statement of Research*
No

If no written statement will be provided, please provide justificiation

The following documents are currently attached to this item:

There are no documents attached for this item.

Risk / Benefit

Potential Study Risks
Given each of these patients has been determined to need a blood transfusion, minimal risk exists in receiving single-unit versus multiple-unit protocols. Multiple-unit transfusion is our current standard of care. The risk of the single-unit protocol is that the patient may require a prolonged length of stay to receive blood more slowly (one unit at a time) as well as slower relief of symptoms. In addition, more blood may expose a patient to increased likelihood of infection, reaction, or antibody development.

Potential Study Benefits
It is unclear whether single-unit or multiple-unit transfusion is more beneficial to the patient. Single-unit transfusion protocol may expose the patient to decreased total units, thereby decreasing the risk of transfusion reaction, antigen exposure, and infection via the blood product. There is a large benefit to society in terms of determining whether single-unit transfusion is superior to our current standard of care as it could lead to decreased use of a scarce medical resource, donated blood.

Alternatives to Participation (optional)
Outside of the study, it will be provider dependent whether a patient receives 1 or 2 units of blood.

Data and Safety Monitoring
The study PI will be responsible for ensuring the ongoing quality and integrity of the research study. An adverse event (AE) is any symptom, sign, illness or experience that develops or worsens in severity during the course of the study. Intercurrent illnesses or injuries should be regarded as adverse events. Abnormal results of diagnostic procedures are considered to be adverse events if the abnormality: results in study withdrawal is associated with a serious adverse event is considered by the investigator to be of clinical significance Need for additional blood products, transfusion reactions, and prolonged length of stay will not be considered adverse events as they represent expected issues related to the single-unit blood transfusion protocol. We plan to start recording adverse events at the time of randomization until the follow up visit. Information on all adverse events will be obtained by review of the medical record and recorded immediately in the source document, and also in the appropriate adverse event module of the case report form (CRF). The PI will review all adverse events weekly. All adverse events occurring during the study period will be recorded. The clinical course of each event will be followed until resolution, stabilization, or until it has been determined that the study intervention or participation is not the cause. Serious adverse events that are still ongoing at the end of the study period will be followed up to determine the final outcome. Any serious adverse event that occurs after the study period and is considered to be possibly related to the study intervention or study participation will be recorded and reported. The relationship of each adverse event to the study procedures will be characterized by the principal investigator as definitely related, probably related, possibly related, unlikely or unrelated. The Investigator will promptly notify the Penn IRB of all on-site unanticipated, Adverse Events that are probably or definitely related to the study procedures. Other unanticipated problems related to the research involving risk to subjects or others will also be reported promptly. Written reports will be filed using the HS-ERA and in accordance with the Penn IRB timeline of 10 working days. If an AE has not resolved at the time of the initial report and new information arises that changes the investigators assessment of the event, a follow-up report including all relevant new or reassessed information (e.g., concomitant medication, medical history) should be submitted to the IRB. The investigator is responsible for ensuring that all SAEs are followed until either resolved or stable.

The following documents are currently attached to this item:

There are no documents attached for this item.

Risk / Benefit Assessment
Given each of these patients was already in clinical agreement to receive a blood transfusion, we believe

that there is minimal risk in transfusing 1 versus 2 units at a time. We feel that the potential benefit to the individual patient and to society outweighs that risk.

General Attachments

The following documents are currently attached to this item:

Informed consent form (smartconsentpostirbeditsfeb152018clean.docx)

Additional forms (smartconsentpostirbeditsfeb152018.docx)

Cover Letter (smartirbresponsesfeb142018.docx)

Questionnaires (smartepds.pdf)

Questionnaires (smartsurveyinstruments4-6weeks.docx)