

**Use of Convalescent Whole Blood or Plasma
Collected from Patients Recovered from Ebola Virus
Disease for Transfusion, as an Empirical Treatment
during Outbreaks**

**Interim Guidance for National Health Authorities and Blood
Transfusion Services**

Version 1.0 September 2014





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WHO/HIS/SDS/2014.8

Use of Convalescent Whole Blood or Plasma Collected from Patients Recovered from Ebola Virus Disease for Transfusion, as an Empirical Treatment during Outbreaks

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1 Introduction

While there is no proven treatment available for Ebola virus disease (EVD), whole blood collected from patients in the convalescent phase of infection has been used as an empirical treatment with promising results in a small group of EVD cases.¹ During the current ongoing EVD outbreak, whole blood and plasma collected from EVD recovered patients has been prioritized for investigation, as one of the treatment modalities.² The concept that this treatment could be efficacious is biologically plausible, as convalescent plasma has been used successfully for the treatment of a variety of infectious agents.³

This interim guidance to national health authorities and blood transfusion services outlines the steps required to collect convalescent whole blood (CWB) or plasma (CP) from EVD recovered patients for transfusion to patients with early EVD, as an empirical treatment modality. It covers:

- The identification of patients recovered from EVD as potential blood donors;
- informed consent and selection of donors;
- donor's blood grouping and screening for transfusion transmissible infections (TTI);
- blood collection and donor care;
- labelling, storage and data collection in blood transfusion services (BTS);
- informed consent of EVD patients;
- patient's blood grouping and compatibility testing;
- storage and transportation of CWB/CP to the sites where transfusions is to be given;
- selection of EVD patients for this intervention;
- the clinical transfusion process;
- data collection at the transfusion site; and
- assessment of the effectiveness of this empirical treatment.

The convalescent WB or plasma should be collected, prepared, stored and transfused in facilities capable of implementing the guidance provided in this document. If the transfusions are planned to be given in a field situation, the *WHO Checklist for essential items for blood transfusion in emergency settings* can provide a useful source of additional information.⁴

This interim guidance will be updated as further evidence and experience accumulates.

2 Guidance on donor selection, screening, donation and handling of blood and plasma units

2.1 Identification of suitable blood or plasma donors among patients recovered from EVD

¹ Mupapa K, Massamba M, Kibadi K, Kuvula K, Bwaka A, Kipasa M, Colebunders R, Muyembe-Tamfum JJ.. Treatment of Ebola hemorrhagic fever with blood transfusions from convalescent patients. International Scientific and Technical Committee. J Infect Dis 179 Suppl 1:S18-23, 1999.

² Statement on the WHO Consultation on potential Ebola therapies and vaccines
<http://www.who.int/mediacentre/news/statements/2014/ebola-therapies-consultation/en/>

³ Luke TC, Casadevall A, Watowich SJ, Hoffman SL, Beigel JH, Burgess TH. Hark back: Passive immunotherapy for influenza and other serious infections. Crit Care Med. 2010 Apr;38(4 Suppl):e66-73.

⁴ WHO Checklist for essential items for blood transfusion in emergency settings
http://www.who.int/entity/bloodsafety/transfusion_services/essential-items_bts.pdf?ua=1

Patients who have recovered from EVD and who have been discharged from Ebola treatment centres or units could be potential donors for CWB/CP, from 28 days after their day of discharge. Ebola neutralizing antibodies are expected to be most effective when CWB/CP is sourced from the areas of on-going active Ebola virus (EBOV) transmission. However, in circumstances where the demand is high and the system is challenged by an overwhelming number of active EVD patients, CWB/CP could also be sourced from the places linked to the current EVD outbreak in West Africa where the outbreak has come under control.

A register or database of patients recovered from EVD as potential CWB/CP donors should be created. Only those EVD patients who have been discharged according to the WHO criteria as: 1) clinically asymptomatic and 2) twice tested negative for EBOV RNA by molecular techniques, should be considered as potential donors. The two samples for EBOV RNA testing should be taken at least 48 hours apart, and the test results should be negative on each sample. Discharge records of EVD recovered patients should be reviewed before considering them as potential CWB/CP donors.

The donor selection criteria used in the country should be reviewed in light of the potentially life-saving impact of these specific donations. An appropriate risk assessment should be done to assess the risk reduction value of each selection criteria against the risk impact of exclusion of the donor. Where the risk to the donor or the patient is seen to be significantly lower than the risk of non-treatment, consideration should be given to relaxing the donor selection criteria for these specific types of donation. For example, if the current age for blood donation in the country is 18-60 years, and there are significant numbers of EVD recovered patients outside this age range, the national health authorities and BTS may consider relaxing the donor selection criteria to widen the potential donor pool.

Given relaxed criteria, recovered patients who are less than the recommended lower age limit for blood donation may donate blood with parental consent following a thorough medical assessment, including an assessment of total blood volume to determine the acceptable volume to be collected ($\leq 15\%$ of total blood volume for whole blood). Depending on the weight or total blood volume of the potential donor, blood may be collected in small volume (200 mL) blood collection bags. Those above the upper age limit for blood donation should also be assessed by a physician for their suitability to donate. While certain donor selection criteria could be relaxed, the donors selected for donation should be RNA negative for EBOLA and for the transfusion transmissible infections listed in Section 2.3.

2.2 Donor information, consent and selection

When an EVD recovered patient has been identified as a potential donor, the need for collecting his/her whole blood or plasma donation should be explained, emphasizing that this could be useful as an empirical treatment for the EVD patients. Potential donors should be informed that there will be no payment to them for their blood or plasma donation.

In the event that the potential donor agrees to be considered for CWB/CP donation, he/she should be assessed for suitability to donate blood or plasma through a donor selection process, including general health criteria such as weight, medical and social (i.e. behavioural risk factors) history, basic physical examination and haemoglobin estimation.⁵

⁵ WHO Guidelines on blood donor selection http://www.who.int/bloodsafety/publications/guide_selection_assessing_suitability.pdf

BTS staff should then obtain written informed consent (Annex 1) from the potential donor for donation of a unit of whole blood or plasma for transfusion. Donor confidentiality should be maintained to avoid any coercion to donate from the community.

2.3 Donor's blood grouping and TTI screening

Potential donors who meet the WHO criteria of recovery from EVD (see section 1) and who also meet the donor selection criteria identified above and have given informed consent should then be subjected to pre-donation testing to assess final suitability for donation, according to the national policy and routine procedures.

Pre-donation testing should include:

- ABO and RhD grouping
- Blood screening tests for HIV, HBV, HCV, syphilis and other locally transmitted infections, as applicable
- Haemoglobin estimation (unless performed as part of the initial donor selection process)
- Where possible, titration of total Ebola antibodies and Ebola neutralizing antibodies could also help in the qualification of the donor, particularly if the donor is willing to continue serving as CWB/CP source.

Depending on the test to be performed and the assay system used, either serum or plasma could be used for these tests. Two blood samples of five mL each should be collected for these tests, one in EDTA for a plasma sample and the other one in a plain tube (without anticoagulant) for a serum sample. Residual serum from these blood samples should be stored in aliquots for retrospective antibody testing or any other tests, as required.

2.4 Blood collection and donor care

The results of the pre-donation testing should be reviewed. Potential donors who test negative for all TTI tests and meet all other criteria of donor suitability should be selected for CWD/CP donations. In the event that the time between the pre-donation testing and the donation exceeds 48 hours then the routine TTI testing should be repeated at the time of donation.

Whole blood donation should be collected in a single blood collection bag or if feasible, in a double blood collection bag for the separation of plasma from the red cells by sedimentation or centrifugation. Where possible CP could also be collected by apheresis procedure from suitable donors. Plasmapheresis will enable collection and storage of large volumes of CP that may be used for more than one patient.

The donor should be provided with good care before, during and after the whole blood or plasma donation procedure. Any adverse donor reactions should be adequately and promptly managed and recorded. The *WHO Guidelines on drawing blood: Best practices in phlebotomy* may provide a useful source of information.⁶

⁶ WHO Guidelines on drawing blood: Best practices in phlebotomy
http://whqlibdoc.who.int/publications/2010/9789241599221_eng.pdf?ua=1

A minimum period of 12 weeks for males and 16 weeks for females should occur before a further whole blood donation is collected. The inter-donation interval for collection of plasma by apheresis should be two weeks. The minimum interval before a plasmapheresis donation should be four weeks following a whole blood donation or a failed return of red cells during apheresis.

Potential donors with abnormal TTI test results should be referred to appropriate health-care institutions for further investigation, confirmation, counselling, treatment and care.⁷

2.5 Storage of whole blood and plasma units, inventory management and transportation

Donated CWB should be stored between +2°C and +6°C (never frozen) preferably in a separate blood bank refrigerator dedicated to CWB/CP units, fitted with a temperature monitoring system and alarm. In case a separate refrigerator is not available, consideration should be given to storing these units on a separate, labelled shelf within the refrigerator. The storage duration will depend on the anticoagulant and preservative solution in the blood collection bag and must strictly follow manufacturer's instructions. It may be stored up to 35 days if collected in citrate phosphate dextrose with added adenine (CPDA-1). Appropriate labelling should be done to clearly identify CWB/CP units.

CP separated from whole blood donations or collected by apheresis may be stored as 'Liquid Plasma' between +2°C and +6°C in blood bank refrigerators for up to 40 days. Alternatively, it may be frozen either within 8 hours of collection as 'Fresh Frozen Plasma' or within 18-24 hours of collection as 'Plasma Frozen Within 24 hours' and stored for up to 12 months at or below -18°C in a controlled plasma freezer.⁸

Where there are no facilities to prepare CP by centrifugation, it could be separated from CWB collected in double bags. A CWB unit can be stored vertically for 24 hours between +2°C and +6°C, the supernatant plasma can then be transferred into the secondary bag, and stored as liquid plasma.

Careful inventory management procedures should be in place for these CWB/CP donations collected, with full consideration of ABO and RhD blood groups and age of the CWB/CP units, to minimize loss due to expiry. The CWB/CP units should be transported in temperature controlled conditions.

Considerations shall be given to the need for extended storage of unused expired CWB/CP, to make them available for research purposes.

3 Guidance on transfusion of convalescent whole blood or plasma

3.1 Selection of EVD patients

Only patients with confirmed EVD⁹, preferably in its early stages, should be considered for CWB/CP transfusion, as an empirical treatment for EVD.

⁷ WHO/CDC/IFRC implementation guidelines: Blood donor counselling

http://www.who.int/bloodsafety/voluntary_donation/Blooddonorcounselling.pdf?ua=1

⁸ WHO Manual on the management, maintenance and use of blood cold chain equipment

http://www.who.int/entity/bloodsafety/Manual_on_Management,Maintenance_and_Use_of_Blood_Cold_Chain_Equipment.pdf?ua=1

⁹ Case definition recommendations for Ebola or Marburg Virus Diseases <http://www.who.int/csr/resources/publications/ebola/ebola-case-definition-contact-en.pdf?ua=1>

3.2 Informed consent

If feasible, informed consent for transfusion of CWB/CP should be obtained from the EVD patient or the family members (Annex 2).

3.3 Collection of patient's blood samples for laboratory testing

The patient should be correctly identified. Two venous blood samples of 5 mL each should be collected from the patient prior to transfusion; one in EDTA for a plasma sample and the other one in a plain tube (without anticoagulant) for a serum sample. These samples are for (a) ABO and RhD blood grouping and cross-matching and (b) for baseline viral load assay.

One 5mL sample should be taken in a plain tube (without anticoagulant) for a serum sample on the day after transfusion to measure viral load and for any other tests, as required.

Prior to discharge of patients that recover, two additional 5 mL samples (each in a plain tube without anticoagulant) are required on consecutive days for viral load measurements. Residual serum from these blood samples should be stored in aliquots for retrospective antibody testing or any other tests, as required.

3.4 Selection of convalescent whole blood or plasma units for transfusion

ABO and RhD matched blood or plasma units should be selected for transfusion. RhD negative units should be used for transfusion to RhD negative women of child-bearing age, if feasible. If the RhD group of the patient is not known or in case of non-availability of RhD specific group, blood matched only for ABO group may be used.

To reduce the risk associated with handling infectious blood samples, cross matching of patients' serum and donors' red cells, may be omitted if ABO group compatible CWB/CP is selected.

When it is not possible to test the patient's ABO group or if ABO matched CWB/CP is not available then:

- For whole blood transfusion: Group O convalescent whole blood, ideally from donors with low titre anti-A and anti-B, should be used;
- For plasma transfusion: Group AB convalescent plasma separated by centrifugation should be used.
 - Non ABO-matched CP separated by centrifugation could also be considered if group AB plasma is not available, but should preferably be group A or group B.

CP prepared by 24-hour sedimentation should only be used for ABO group compatible recipients due to the higher red cell concentration.

3.5 Administration of convalescent whole blood or plasma

CWB/CP units should be transfused to the EVD patients using standard clinical transfusion procedures. One unit of CWB (collected in a 350/450 mL blood collection bag) should be transfused for adult patients. In the absence of evidence, 400-500 mL of CP in two doses of 200-250 mL each, separated from two different WB donations, should be considered for adult patients. For paediatric CWB/CP transfusion, a dose of 10 mL/kg could be used based on the considerations of blood volume.

Slow intravenous transfusion should be given with careful monitoring of the patient for any acute transfusion reactions, particularly during the first 15-20 minutes. Transfusion should be completed within 1-4 hours of commencement with monitoring and recording of the patient's vital signs.

If frozen plasma is being used for transfusion, it should be thawed in a water bath between +30°C and +37°C or other suitable thawing device before use and infused using a blood administration set as soon as possible after thawing. The *WHO Clinical Use of Blood Handbook* may provide a useful source of information.¹⁰

In areas with high malaria transmission, the recipient of the convalescent WB/CP transfusion should be given a full treatment course with an effective antimalarial medicine, immediately following the transfusion. The first-line antimalarial treatment recommended for uncomplicated malaria should be used for this purpose.¹¹

The need for repeat transfusion of CWB/CP should be determined based on the clinical response and if feasible, on the level of neutralizing Ebola antibodies in the donor and the patient.

Records shall be kept to assure traceability between donors and recipients.

3.6 Patient monitoring

EVD patients receiving convalescent whole blood or plasma transfusion should be closely monitored to assess the effectiveness of this intervention. In addition to clinical monitoring, this would also include measurement of viral load, Ebola antibody levels and other tests, according to the sampling scheme in section 3.3. Standard case reporting forms are being developed to monitor all potential interventions for EVD, and the WHO website (www.who.int/csr/disease/ebola/en/) should be consulted for the current version.

4 Other considerations

Countries should ensure that they have the capacity to support these interventions. This includes adequate human resources and critical supplies, infection control procedures in place, as well as the ability to collect, analyse and interpret data.

4.1 Human resource and supplies of critical materials

BTS should work with national health authorities to ensure that appropriate levels of equipment, consumables and trained staff are available in the relevant regions for safe blood collection from patients recovered from EVD, and for testing and adequate storage and transportation of CWB/CP.

4.2 Infection control

¹⁰ WHO Clinical Use of Blood Handbook http://www.who.int/bloodsafety/clinical_use/en/Handbook_EN.pdf?ua=1

¹¹ WHO Global Malaria Programme: Country antimalarial drug policies by regions
http://www.who.int/malaria/am_drug_policies_by_region_afro/en/

The handling of blood samples from patients with EVD for blood grouping and cross-matching by the hospital blood bank or laboratory personnel, should be done in accordance with specific infection prevention and control guidelines for the handling and disposal of highly infectious materials.^{12,13} Any serum/plasma samples being archived for future testing should also be handled and stored in a similar manner. Standard safety precautions should be followed for the handling of blood and plasma donations and samples from CWB/CP donors.

4.3 Data collection, analysis and interpretation

Information on a minimum number of data elements for donors and patients should be collected using a data collection form (Annex 3) primarily for health statistics purposes and also for the assessment of patients' response, without compromising the urgency of the treatment. In order to assess the value of this treatment intervention, it is important to gather data on patient outcome with respect to their EVD infection.

Data on any adverse reactions in donors or transfusion recipients should be documented as part of the hospital or national haemovigilance system.

¹² WHO Interim infection prevention and control guidance for care of patients with suspected or confirmed filovirus haemorrhagic fever in health-care settings, with focus on Ebola, WHO, Geneva, 2014.

http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1

¹³ WHO Guidance: How to safely collect blood samples from persons suspected to be infected with highly infectious blood-borne pathogens <http://www.who.int/csr/resources/publications/ebola/blood-collect-en.pdf?ua=1>

Acknowledgements:

This interim guidance has been developed by the WHO-HQ Department of Service Delivery and Safety in collaboration with the Departments of Pandemic and Epidemic Diseases, Knowledge, Ethics and Research & Essential Medicines and Health Products; and WHO-AFRO Divisions of Health Systems and Services & Immunization, Vaccines and Emergencies and includes comments from WHO Global Blood Safety Network; WHO Experts on Blood Transfusion Medicine and Biological Standardization from Bhutan, Cameroun, Hong Kong SAR, China, Ghana, Honduras, Italy, Malaysia, New Zealand, Singapore, South Africa, UK and USA; WHO Blood Regulatory Network; WHO-AMRO/PAHO Division of Health Systems and Services; Centers for Disease Control and Prevention, Atlanta; International Severe Acute Respiratory and Emerging Infection Consortium; African Society for Blood Transfusion; ICCBBA; European Blood Alliance; International Society of Blood Transfusion; and AABB.

Annex 1

Example of a consent form for the donation of convalescent whole blood or plasma to treat Ebola virus disease

1. General information about Ebola virus disease (EVD) and convalescent whole blood or plasma for EVD treatment

Ebola virus disease (EVD), also called simply Ebola, is a disease transmitted through close contact with the blood, secretions, other bodily fluids, or organs of infected animals and people. Some of the symptoms of the disease include fever, nausea, vomiting, headache, diarrhoea and bleeding. The disease is often severe and in the best health facilities only 3-5 out of 10 patients recover.

Except for some experimental treatments, no treatment or vaccine is currently available to treat or prevent EVD. Only a few primary prevention measures have been established focusing on avoiding direct contact with the body fluids of animals and people infected with the virus. If a treatment for EVD could be found, it would save many lives.

People like you, who have recovered from EVD, did so, because your body was able to fight the disease and now your blood contains substances which are capable of fighting EVD. This ability remains for life – that is you will never have EVD again, even if the Ebola virus enters your body again. We think that patients who currently have the disease, could improve faster if they received some of your blood or plasma (the liquid part of your blood) that has the ability to fight EVD. But we don't know this for sure. It is possible that a patient with EVD may not recover, even after receiving blood from a person who has recovered from EVD. Because we don't have any other treatment option at present, we would like to try it in case it is successful, as it has been for certain other viruses. You could think of this as a gift to another person.

To try out this treatment, we will first ask you to allow us to review your medical records from the health facility which treated you for Ebola, to assess if you can safely donate blood or plasma.

2. What will happen if you agree to donate blood?

a) Testing your blood

If you agree to donate some blood or plasma for the treatment of EVD, we will ask you to come to the blood donation centre and we will first take a small amount of your blood (about 10 mL), about a tablespoonful, from a vein in your arm using a single use sterile syringe and needle and do some tests that will tell us the type of blood that you have and also whether your blood can be used for treatment of EVD. If the amount of haemoglobin is too low or if your blood has the possibility of causing disease in another person, or you are not able to donate due to some other reason, we will not be able to accept your blood donation. If that happens, we will explain to you in detail the reasons why your blood cannot be taken, and if you need to have any medical treatment. If, however, you are suitable to donate, we will arrange a suitable time for the donation.

b) Collection and storage of blood or plasma units

For the donation, we will ask you to come to the blood donation facility, where you will be given something to drink (water or juice) before the donation of blood or the liquid part of your blood (plasma). Donating blood is very simple. The nurse/doctor will then ask you to lie on a couch or clinic bed. The inner area of one of your elbows will be cleaned with an antiseptic solution before a trained health worker inserts a sterile needle, connected to a blood bag, into your vein. The volume of blood taken will be about 350-450 mL. It usually takes only about 10 minutes to donate a unit of blood.

If you are donating the plasma on a special machine, a trained health worker will put a small needle into a vein in your arm, through a sterile single use needle, after making that part of the arm numb. A small tube will be connected to a machine that will collect the liquid part of the blood into a separate bag, and return the red part of your blood back to your body. To stop the blood from clotting, a liquid, known as an anticoagulant, will be automatically mixed with the blood as it is pumped from the body into the machine. The trained health worker will collect about half a litre (e.g. small mineral water bottle) of plasma. This procedure will take about 45-60 minutes.

You will be given light refreshments after the procedure. After resting for about 15-30 minutes, you will be able to return to your normal activities, although you should avoid strenuous activities for the rest of the day. You should drink plenty of fluids over the next 24 hours. Your body will replace the lost fluid within about 36 hours.

c) What happens next?

The blood that has been collected will be stored in a refrigerator with an identification number. If plasma has been collected or separated from your whole blood donation, it will also be stored in a refrigerator or freezer. It will not have your name on it. The remaining red cells may or may not be used. When there is a patient who is likely to benefit from the use of blood or plasma donated by you, it will be taken out from the stock, and brought to room temperature, and then given to the patient through a vein. We will keep a close watch on the patient and record everything, so that we learn from the experience and know more about its use in the treatment of EVD.

3. Possible risks and discomforts

Taking blood from your arm may sometimes cause bruising, mild pain or discomfort and in very rare circumstances, infection. We will take all preventive measures to minimize these risks. Some people may feel light-headed or little giddy, especially while donating plasma. This lasts for only a few minutes and quickly subsides.

4. Confidentiality

Any information that you provide and all test results will be treated confidentially. The medical staff who test your blood have the responsibility to inform you of all the blood test results, and to advise you on any treatment they think you will require.

5. Will I know who receives my blood?

A patient with early EVD would receive your blood. It is difficult to predict who exactly will receive the blood that you donate. The person must have a compatible blood type to yours. Your name will not be on the blood or plasma you have donated, it will just be identified with a unique donation number. So no one will know whose blood is being given to the patient. And you will not know who receives it either. But be assured that it will be used for a patient who requires it and all information about you and your donation will remain confidential.

6. Will the person who receives the blood know who has provided it?

No. no-one, including the person who receives your blood, will know who has provided the blood. This is so that your privacy can be protected.

Be assured that the blood or plasma that we collect will be treated with respect.

7. Expenses and payments

There will be no charges to you for any cost related to this donation. There will be no payment for you to participate in this donation either.

8. Participation and withdrawal from donation

You are free to decide whether or not to donate blood or plasma. If you do not meet the donor suitability criteria, you will be immediately informed by the doctor in charge

Once your blood and/or plasma has been collected, you can request that it is withdrawn at any time prior to it being transfused to a patient by informing the attending doctor.

You cannot request that your blood or plasma donation should not be used for transfusion, once it has been given to a patient. Your decision to request the discard of your blood or plasma, if it has not been transfused, will not affect your future care.

9. Who to contact if you have any questions

If you have any questions, feel free to contact us at the blood centre

Your signature documents your permission for the donation.

Signature of Donor: x	Full Name: x	Date of Signature: ___/___/___
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Annex 2

Example of a consent form for treatment with experimental convalescent whole blood or plasma therapy

1. Information about the disease

You/your child/family member has been diagnosed with Ebola virus disease (EVD). The disease is transmitted through close contact with the blood, secretions, other bodily fluids or organs of infected animals and people. Some of the symptoms of the disease include fever, nausea, vomiting, headache, diarrhoea and bleeding. The disease can be quite severe and in the best centres only 3-5 out of 10 patients recover.

Currently, no medicine exists that has been tested in human beings so we don't have any medicines or vaccines to treat or prevent EVD. Only a few primary prevention measures have been established focusing on avoiding direct contact with the body fluids of animals and people infected with the virus. If a treatment for EVD could be found, it would save many lives.

People who recover from EVD do so because their blood contains substances which are capable of fighting EVD. This ability remains for life, meaning that they will never have EVD again, even if the germ enters their body again. We think that patients with EVD might improve faster if they received the blood or plasma (the liquid part of blood) from those who have recovered from EVD, because it may have the ability to fight EVD.

2. What are we asking you?

We are asking you if you/your child/family member would consider receiving blood or plasma from someone who has recovered from EVD. Their blood and plasma will have substances that could improve your/your child's/family member's chances of recovery.

We don't know if this treatment will help you/them or not, and we don't know if it will have any harmful effects either, but this is the only treatment that we have at present, but you need to know that it has not yet been tested in humans. Because we don't have any other treatment option at present, we would like to try it out, and learn from the testing.

3. What will you be asked to do if you ask to receive this treatment?

You/your child/family member will be given the blood or the liquid portion collected from the blood of a person who has recovered from EVD. It will be given into one of your/their veins, using a sterile single use needle, and will be given over the course of about one hour. About 350-450 mL of blood or 200-500 mL of plasma separated from the blood will be given at each treatment. Depending on tests that will be carried out on your blood/the blood of your child/family member after this treatment, it could be repeated in the following days with blood or plasma from different donors.

Because this therapy has not yet been tested in humans, and you want to try this new therapy, we would like to learn as much as possible about its effects on human beings. We will therefore record as much information about you and your response to the treatment as possible.

4. Can I change my mind after I say ‘Yes’:

Yes, you can change your mind at any time. If you wish to stop the treatment, just tell your doctor. Your decision will not stop you from getting the usual care that all patients receive at this centre.

5. What is the benefit from receiving this treatment?

We cannot promise that this treatment will help you because we are not certain how good convalescent blood or plasma is for treating Ebola. However we believe that this treatment might be effective in improving the likelihood of you/your family member recovering from the disease.

6. What are the risks from receiving this treatment?

Blood and plasma have been used for many other conditions, and in general are very safe. Although the risk of contracting Ebola infection from receiving the treatment has not been tested yet, we believe that it would be low as the blood has been tested negative for the EVD virus and because the donor has fully recovered from the infection. Transfusion also carries the risk of adverse reactions and transmission of infections including HIV and Hepatitis B and C, though these risks are low as only screened and compatible blood is used for transfusion.

7. Do you have other choices?

You can choose to get this treatment or not. Your choice will not affect the care that you are receiving at this centre. We will always do our best to take care of you. If you agree to this treatment, you will also be helping us learn whether the treatment works and how it works to help other patients, though you can withdraw at any time.

8. What treatment costs will be paid?

You will not have to pay anything to receive this treatment.

9. How will your privacy be protected?

Your medical records will only be reviewed by the doctor and nurses who are treating you and other appropriate regulatory authorities. Additionally, all the information or data collected on you to help understand if the therapy is effective will be kept confidential and only be used by specialists to better understand EVD and its potential treatment(s).

10. Who can I talk to?

If you have questions, concerns about the treatment or medical problems, you can talk to your doctor.

Your signature documents your permission to use this experimental treatment.

Signature/thumbprint of Patient: x_____	Full Name: x_____	Date of Signature: ____/____/____
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If the patient is unable to give consent (i.e. incapacitated), consent from the next of kin can be obtained:

Signature/thumbprint of Next of Kin: x _____	Full Name: x _____	Relationship to Patient x _____	Date of Signature: ____/____/____
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If the patient is a minor, consent from the parent or next of kin, and if possible, assent of the child to be obtained:

Signature/thumbprint of parent/next of kin x _____	Full Name: x _____	Relationship to Patient x _____	Date of Signature: ____/____/____
Signature/thumbprint of child	Full name		Date of Signature

I, the undersigned, have fully explained the relevant information of this treatment to the person named above and will provide her/him with a copy of this signed and dated informed consent form.

x _____ Physician Signature	x _____ Full Name	____/____/____ Date of Signature
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If the person giving consent cannot read the form themselves, a witness must be present and sign here:

I was present with the patient throughout the entire informed consent process. This form was read accurately to the patient, all questions from the patient were answered and the patient has agreed to the treatment.

x _____ Witness Signature/thumbprint	x _____ Full Name	____/____/____ Date of Signature
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Example of a Data Collection Form

Treatment with convalescent whole blood (CWB) or plasma transfusion (CP)

Donor Records			
Date of donation		Place of donation	
Registration number		Blood or plasma unit number	
First name		Family Name	
Age		Gender	
Nationality		Date of discharge from EVD treatment centre	
Weight		Temperature & Pulse	
BP		Haemoglobin	
ABO blood group		RhD blood group	
EBOV RNA results #1		Tests done on	
EBOV RNA results #2		Tests done on	
HIV test result		Marker tested	
HBV test result		Marker tested	
HCV test result		Marker tested	
Syphilis test result		Marker tested	
Any other infection(s)		Marker(s) tested	
Total antibody titre to EBOV		Neutralizing antibody titre	
Volume of blood collected		Date of donation	
Type and volume of anticoagulant			
Donor reaction	yes/no	Type of reaction	
CWB expiry date		CP expiry date	
Donor serum sample archived	yes/no	Name of staff collecting blood	

Patient Records			
Date of transfusion		Place of transfusion	
Registration number		Date of onset of EVD	
First name		Family Name	
Age		Gender	
Patient's ABO group		Patient's RhD group	
Nationality		Product transfused	CWB/CP
Convalescent plasma	Liquid plasma by sedimentation	Liquid plasma by centrifugation	Thawed from Fresh Frozen Plasma
Blood or plasma unit number transfused		ABO and RhD group of unit transfused	
Time of starting transfusion		Time of completing transfusion	
Patient vital signs			
Transfusion reaction	yes/no	Type of reaction	

Volume transfused		Name of staff performing clinical transfusion	
Patient serum sample archived	yes/no		
Patient monitoring after transfusion			
Clinical follow up		Date	
EBOV RNA		Date	
Viral load		Date	