1. TITLE

The safety and efficacy of packed cord red blood cell transfusion for severe anaemia in children in a Kenyan hospital

2. INVESTIGATORS AND INSTITUTIONAL AFFILIATIONS

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Dr Samuel Akech, KEMRI
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(* See Appendix D for letter of collaboration with Ministry of Health staff)

3. SUMMARY

Blood transfusion services in sub-Saharan Africa continue to struggle to provide adequate quantities of safe blood. Umbilical cord blood, which is usually discarded, is a potential but untested source of blood for transfusion in young children with severe anaemia. In previous studies we have demonstrated the feasibility and microbiological safety of cord blood collection at Coast Provincial General Hospital in Mombasa. Worldwide, there is little experience of allogeneic cord blood transfusion in young children and no experience in Africa. This protocol describes a study in which we will transfuse packed cord red blood cells to closely observed children with severe anaemia. This will provide safety and efficacy data, which will inform the justification for, and design of, a randomised controlled trial of packed cord red blood cell transfusion and adult-donated whole blood.

4. BACKGROUND

Severe anaemia in children in sub-Saharan Africa

In sub-Saharan Africa the mortality rate of children aged less than five is currently 187 per 1000 live births and the region is very unlikely to meet its Millennium Development Goal target of reducing this to 62 per 1000 live births by 2015 (World Bank Group 2004). Severe anaemia is a major public health problem in the region and has been estimated to kill as many as 974,000 children under 5 per year (Murphy and Breman 2001). In malaria endemic areas, *Plasmodium falciparum* malaria is the most common cause of severe anaemia in children admitted to hospital and children aged less than 24 months are the most frequently affected. The prevalence of severe anaemia (defined as haemoglobin < 5g/dL) in hospitalised children is reported to range from 8 – 29% with case fatality rates of 8 – 18% (World Health Organisation (WHO) 2001a).

In children with severe, uncompensated anaemia, blood transfusion can substantially reduce mortality (Lackritz *et al.* 1997). Over 50% of deaths occur within 4 hours of admission and early intervention and the ready supply of safe blood have been identified as key components in the hospital treatment of severe malarial anaemia in childhood (English *et al*. 2002; Lackritz *et al.* 1992; WHO Communicable Disease Cluster 2000).

In many countries of sub-Saharan Africa the administration of blood is often delayed because the blood supply is insufficient and there is an over-reliance on family/replacement donors (Hassall 2004). In 1975 the World Health Assembly urged member states “to promote the development of national blood transfusion services based on voluntary non-remunerated blood donors” (WHA 28.72; quoted in Hollan *et al*. 1990, p. xi) yet 25 years later less than 15% of countries in the WHO’s Africa Region have a national blood transfusion policy (WHO Regional Office for Africa 2001).

Umbilical cord blood as a supplementary source of blood for transfusion

After the delivery of an infant and the clamping and cutting of the umbilical cord, a quantity of fetal blood remains in the umbilical and placental veins ('cord blood'). The volume of this blood is determined by the weight of the infant (approximately 120ml/kg) and the degree of placento-fetal transfusion prior to the clamping of the cord (van Rheenan & Brabin 2004; Yao *et al.* 1969). In hospital deliveries, it is usually discarded with the other placental products.

In some centres in developed countries, cord blood is routinely collected as a source of haematopoietic stem cells for transplant (see Brunstein & Wagner 2006 for review). It is also, however, a potential source of both autologous and allogeneic blood for transfusion (see below). A pilot project in Ghana (Hassall *et al.* 2003) and data from our current studies have demonstrated that cord blood collections are of sufficient mean volume and haematocrit to be of potential clinical benefit in the emergency treatment of children with severe anaemia. In countries where the blood supply is limited and young children receive a significant proportion of blood transfusions, umbilical cord blood could be a useful supplement to the blood supply.

This study forms part of the third phase of a three-phase project assessing the feasibility, safety and efficacy of umbilical cord blood transfusion for young children with severe anaemia in Coast Province, Kenya. An outline of the entire project is given below:

PHASE 1 a. Participatory appraisal of the study site
b. Development of blood culture facilities at CPGH

PHASE 2 a. Assessment of the microbiological safety of cord blood
b. Establishment of systems of collection, screening and storage of cord blood

PHASE 3 a. Clinical trial to assess the safety and efficacy of cord blood transfusion for severe anaemia in children
b. Comparative trial of cord blood and adult-donated blood

Phases 1a and 2a were the subject of separate SSC protocols (Numbers 934 and 1032, respectively) and data from both studies informs this submission. This protocol refers to Phase 3a only.

Existing acceptability, safety and efficacy data

The following is a summary of existing acceptability, safety and efficacy information relating to cord blood transfusion. More detailed data from Phase 2a, which is referred to in this section, is contained in Appendix A.

Data relating to the cultural acceptability of cord blood donation and transfusion

The collection of cord blood and its transfusion to children with severe anaemia is a novel concept to sub-Saharan Africa. The acceptability of this practice is likely to vary with the cultural context. In Phase 1 of this project, we facilitated focus group discussions about the subject with women attending maternity services at Coast Provincial General Hospital (CPGH). These discussions elicited a range of views regarding cord blood donation and transfusion, from which we designed a structured questionnaire. This was administered to 180 women who had recently delivered at CPGH.

Cord blood donation was acceptable to 81% of the women in our sample. The main reasons given were, “To save a life” and “Because it is going to be thrown away anyway”. The receipt of cord blood to treat severe anaemia in their own child was acceptable to 78% of women. For most of these women the source of blood was unimportant as long as it had been screened. We consider these findings a positive indication that cord blood donation and transfusion will be acceptable to the coastal community in Kenya.

Data relating to microbiological safety of cord blood

Because of the method and site of collection, the bacterial contamination of cord blood has been a concern for as long as cord blood transfusion has been mooted (for example, Howkins & Brewer 1939; Strauss 1992; Hassall *et al.* 2003). As described in SSC Protocol 1032, we set out to evaluate the rate and nature of bacterial contamination of cord blood collected on the labour ward at Coast Provincial General Hospital compared to adult-donated blood being transfused to children at the same facility over the same time period.

This study is still ongoing but interim results show that the prevalence of bacterial contamination is significantly less in cord blood than adult blood (4.5% vs. 10.3%; p<0.01). These results are tabulated below and a more detailed explanation is given in Appendix A, Section A.

The proportion of adult-donated and cord blood units from which bacteria have been isolated- SSC 1032 interim results (CONFIDENTIAL)

	Adult blood	Cord blood	Odds ratio (95% CI)
TOTAL CULTURED	331	247	
Total positive	34	11	
% positive	10.3	4.5	1.8 (1.0-3.3)
Pathogens	11	4	
% pathogens	3.3	1.6	3.8 (1.2-12.1)

We have also screened maternal blood for the transfusion transmitted infections HIV, HBV, HCV and syphilis and compared prevalence rates with blood donations screened at the Regional Blood Transfusion Centre (RBTC) in Mombasa. Results are shown below:

Prevalence and odds ratios of Transfusion Transmitted Infections in RBTC and cord blood donors (CONFIDENTIAL)

TTI	Prevalence (%) RBTC	Prevalence (%) Cord donors	Odds ratio (95% CI)	Vertical transmission
HIV	3.5	1.9	1.9	MED
HBV	7.4	3.0	2.6	LOW
HCV	3.8	0.8	5.0	LOW
Syphilis	1.7	0.7	2.3	HIGH
TOTAL	16.4	6.4	2.9 (1.8-4.8)	N/A

In our setting, the odds of a transfusion transmitted infection (TTI), either bacterial or viral, are less in cord blood compared to adult-donated blood. The safety of cord blood from this perspective is further enhanced by vertical transmission rates for HIV, HBV, HCV and syphilis of less than 100% (see table). This will also apply to malaria although we have not yet evaluated this. Furthermore, in the proposed study we will continue to screen all cord blood collections for bacterial contamination by culture and gram stain. According to our current data, this will reduce the number of cord blood units containing organisms of high pathogenic potential by 50% (Appendix A, Table 5).

Data relating to processing and storage of cord blood

Cord blood collection for transfusion presents some technical challenges. The volume of blood collected cannot be predicted but the volume of anti-coagulant/preservative (AP) in the collection bag is fixed. Thus the ratio of blood to AP is variable and may depart from values seen in adult-donated blood collections. This may have consequences for both red cell storage (Cober *et al.* 2001) and the dose of anti-coagulant citrate salt in the transfused blood.

Red cell storage lesions can reduce the efficacy of blood transfusion and, through red cell haemolysis, cause high concentrations of extra cellular potassium in stored blood. Citrate anti-coagulants can cause hypocalcaemia through chelation of ionised calcium. Both hyperkalaemia and hypocalcaemia

are usually rare consequences blood transfusion and both can cause cardio toxicity.

We will collect cord blood into citrate-phosphate-dextrose-adenine (CPD-A1) and produce packed red blood cells. This will reduce the dose of citrate as described in detail in Appendix A, Section B. Storage will be for up to 35 days. Storage of cord blood has been evaluated but only in other settings and not with our red cell product (Anderson *et al.* 1992; Bifano *et al.* 1994; Brandes *et al.* 1983; Brune *et al.* 2002; Horn *et al.* 1987; Garritsen *et al.* 2003). As part of ongoing work, we will conduct assays of red cell haemolysis and plasma potassium in packed cord red blood cell units and adult-donated whole blood units.

Data relating to clinical safety and efficacy of cord blood

Although their primary function- to deliver oxygen to the tissues- is the same, cord blood differs from adult blood in several respects. Cord blood has a higher haemoglobin concentration and therefore oxygen carrying capacity than adult blood. This effect is preserved in populations where maternal anaemia is common. In a country like Kenya, where a significant proportion of blood donations to the National Blood Transfusion Service have less than the recommended level of haemoglobin (Rajab *et al.* 2005), this may be a significant advantage from a transfusion perspective. Cord red blood cells are also on average younger than adult red blood cells but their life span is shorter (Pearson 1967).

The dominant haemoglobin in cord blood is fetal haemoglobin (Hb F), which has a higher oxygen affinity than the predominant adult haemoglobin (Hb A). Thus the oxygen dissociation curve of cord blood is shifted to the left with a lower P_{50}. This facilitates the movement of oxygen from mother to fetus and means maximum loading oxygen at lower PO_2 levels (Rennie & Roberton 1999).

Higher than normal levels of Hb F are seen in conditions causing “erythroid stress”, for example in pregnancy, infection and after myelotoxic

chemotherapy (Weatherall & Clegg 2001). They also occur in β-chain haemoglobinopathies such as β-thalassaemia and hereditary persistence of fetal haemoglobin. In such circumstances, high levels of Hb F appear to be of no physiological consequence and in some cases may be of benefit. Pharmacological induction of Hb F with hydroxyurea is used in the amelioration of sickle cell disease in adults (Steinberg 2006).

Accounts of allogeneic cord blood transfusion to treat anaemia in both adults and children in Northern countries pre-date the advent of modern blood transfusion services (Halbrecht 1939; Page *et al.* 1939). Safety and efficacy data are rather anecdotal in these descriptions.

More recently in India, transfusion of whole cord blood has been used for a series of about 200 anaemic (Hb<8g/dL) patients with a variety of underlying conditions (Bhattacharya 2006a-i, Battacharya 2005a,b; Bhattacharya *et al.* 2001). These patients, the vast majority of whom were adults with chronic and/or terminal disease, received between 1 and 28 units of cord blood. No "clinical, immunological or non-immunological reactions" are said to have been encountered with any of the patients although specific outcome measures are consistently poorly defined and reported.

In developed countries the recent focus of cord blood transfusion has been on autologous packed red cell transfusion in neonates. In case reports and one study of 52 newborns, no major concerns regarding safety and efficacy have been reported (Ballin *et al.* 1995; Brune *et al.* 2003; Tamayo 1966).

Trial design

From the perspective of the severely anaemic child, the most important property that cord blood possesses is that which it shares with adult-donated blood- oxygen carrying capacity. As described above, however, there are sufficient differences in its structure and function and particularly in its processing and presentation to merit demonstration of clinical safety in a Phase 1 trial. There is no such data on allogeneic cord blood transfusion in

children with acute, severe anaemia. Furthermore, packed red blood cells although recommended (WHO 2001b, p 277) are rarely used in hospitals in sub-Saharan Africa (Appendix A, Section C).

Efficacy data from this Phase 1 trial will indicate whether packed cord red blood cell transfusion is likely to be inferior, equivalent, or superior to adult-donated blood. This will have major implications for the appropriateness and the design of the planned comparative trial. In addition, the trial 'dynamics', which will be a consequence of a number of factors including: the supply of cord blood; the number and weight of eligible children; the proportion of eligible children from whom consent is obtained; and the availability of the adult-donated blood, will determine the feasibility and design of a subsequent trial.

5. JUSTIFICATION

Severe anaemia in children requiring an urgent blood transfusion is an important clinical problem in hospitals in Kenya and other countries in sub-Saharan Africa. An insufficient blood supply, however, means that safe blood is not always immediately available for transfusion. Umbilical cord blood, transfused as packed red blood cells, could be a useful supplement to conventional sources of blood in this context. Worldwide, there is little experience of allogeneic packed cord red blood cell transfusion in young children and no experience in Africa. This trial will provide important information regarding the safety and efficacy of packed cord red blood cell transfusion in our setting. This data will inform both the decision on whether or not a larger comparative trial with the current standard (adult-donated whole blood) is appropriate, and the design of such a trial.

6. NULL HYPOTHESIS

This is a descriptive study to acquire safety and efficacy data in a small group of children, and a null hypothesis is not appropriate.

7. OBJECTIVES

a. Primary objective

To assess the safety of packed cord red blood cell transfusion in children with severe anaemia.

b. Secondary objective

To assess the haematological efficacy of packed cord red blood cell transfusion in children with severe anaemia.

8. DESIGN AND METHODOLOGY

a. Study sites

Cord blood collection, screening and processing will continue at CPGH and the RBTC in Mombasa. These systems are described in SSC Protocol 1032 and summarised in Appendix B. Cord blood transfusion, monitoring and follow-up will take place at KEMRI-CGMR(C) at Kilifi District Hospital, where there is a suitably equipped and staffed paediatric high dependency unit. Cord red blood cell units will be transported from the RBTC in Mombasa to the KDH clinical laboratory where they will stored, cross-matched and issued as necessary. Dispensation for this activity will be sought via the National Blood Transfusion Service.

b. Study design

This is an open label trial of packed cord red blood cell transfusion in children with severe anaemia (Phase 1b).

c. Study population

All children aged 12 years or less admitted to Kilifi District Hospital will be eligible to enter the study.

d. Sample size

This is a descriptive study, the primary objective of which is to observe for any severe and unexpected effects of packed cord red blood cell transfusion. To achieve this objective, we will recruit 80 children. If no side-effects related to the use of cord blood are observed, it will be possible to state, with 95% confidence, that the true side effect rate is at most 4.6% (i.e. is 4.6% or less). If side effects are observed, the estimated side-effect incidence rate will have

a precision of ±5%. For the continuous clinical measures being recorded, estimated (mean) values will have a precision of ± one-quarter of one standard deviation - clinically, this is a very acceptable level of precision.

With regard to the secondary objective, a minimum of 55 of the 80 children will be new admissions with acute severe anaemia. This will detect a difference in mean haemoglobin level between the cord blood cohort and historical controls of 1 g/dl or more as being statistically significant (at the conventional 5% level) with 80% power.

e. Sampling

Children for whom a blood transfusion is indicated display a spectrum of clinical severity. In those with signs of severe disease (such as coma and respiratory distress) mortality is high and it would be difficult to assess the safety of cord blood transfusion in this group. We intend, therefore, to recruit patients in whom signs of severe disease are absent.

Young children with acute, severe anaemia are the most likely to benefit from a supplement to the blood supply. They are also the group most likely to yield useful efficacy data at 24 hours and 28 days after a single transfusion. While it is important to assess safety and efficacy in other patient groups, such as malnourished children and neonates, outcomes will be harder to assess in the context of prolonged hospitalisation and multiple interventions including additional transfusions. When or if recruitment of in-patients reaches 30 subjects, recruitment will be confined to acute admissions.

For all cases, selection and participation in the study will be according to the following inclusion and exclusion criteria:

Inclusion criteria

ALL the following inclusion criteria must be met for a child to enter the study:

- Children with severe anaemia for whom a blood transfusion is indicated

  - Children aged less than 3 months: Hb < 10g/dL
  - Children aged greater than 3 months: Hb < 4g/dL
- Children for whom an appropriate volume of packed cord red blood cells of a compatible blood group is available
- Children for whom informed consent to enter the study is given

Exclusion criteria

Children will be excluded from the study if ANY of the following features are present:

- Coma (Blantyre Coma Scale <= 2)
- Prostration (unable to breast feed if aged < 3m, unable to sit if aged > 3m)
- Uncompensated shock
- Compensated shock (capillary refill time > 3s; temperature gradient)
- Respiratory distress (deep breathing)
- Neonatal hyperbilirubinaemia requiring exchange transfusion
- Any other marker of clinical severity considered to preclude the child from recruitment into the study
- Enrolment in another intervention trial
- Children for whom informed consent to enter the study is not possible or not given

f. Clinical and laboratory procedures

Recruitment and consent process

(See Appendix D for patient information sheet)

All new paediatric admissions that present with features of anaemia will have a clinical assessment as part of their routine clinical care. Any child with signs of clinically severe disease will be excluded at this stage. The initial assessment includes weighing and the drawing of blood for laboratory investigations. For in-patients with symptoms of anaemia the weight will already be known. The child's weight will be used immediately to determine

from an on-line cord blood inventory whether there is a suitable unit of packed cord blood red cells available (see Appendix A, Section B).

If there is a suitable unit of cord blood available then one of the study team will introduce the project. They will make it clear that until the results of the laboratory investigations are returned, it will not be certain a) whether a blood transfusion is indicated or, b) whether packed cord red blood cells are available. As soon as the child's blood group is known, the cord blood inventory will again be consulted to ascertain whether packed cord blood red cells of appropriate haemoblobin AND group are available.

If no cord blood is available, the carer of the child will be informed and the child will receive routine clinical care, which may or may not include a transfusion of adult-donated whole blood. If cord blood is available, discussions with the carer will continue as necessary. The decision as to whether or not the child requires a blood transfusion will be concluded by the results of laboratory investigations. In the event that a blood transfusion is indicated, understanding of the study will be checked and written consent to take part sought from the child's carer. If consent is not given, the child will receive routine care including transfusion of adult-donated whole blood. If no adult-donated blood is available, then cord blood will not be transfused outside of the study.

Transfusion management and clinical observation

Once a child is entered into the study, compatibility testing between the recipient and donor cord blood will be performed and the blood issued as normal. Packed cord red blood cells will be transfused over 3-4 hours on the paediatric high dependency unit (KEMRI ward). Intensive monitoring of the child will continue for the course of the transfusion and for the succeeding two hours. The child's general appearance, temperature, blood pressure, pulse, oxygen saturations and respiratory rate will be recorded immediately before each transfusion, after 15 minutes, after 30 minutes and then every 30 minutes until 2 hours after the blood transfusion has ended. Continuous cardiac monitoring will also be performed. Six hours and 24 hours after the

transfusion was started, the child will have a clinical examination. Midway through the transfusion, children will have a blood sample drawn for blood chemistry with particular reference to potassium and calcium levels. All other aspects of the child's clinical management will be as per the routine care of all critically ill children on the unit.

Definitions of adverse events and safety monitoring procedures are given below (Section 8g. *Safety monitoring*).

Efficacy monitoring

As described above, children receiving a cord blood transfusion will have a clinical examination 6 hours and 24 hours after the start of the transfusion. This will include an assessment of haematological status. Post-transfusion haemoglobin measurements will be taken at 24 hours and 28 days. If any study child requires additional transfusion or transfusions, they will receive adult-donated blood and routine care.

Blood sampling

In order to minimise discomfort and the volume of blood drawn from study participants, blood sampling will as far as possible coincide with the routine sampling points for critically ill children. The sampling times of relevance to this study are those at admission (or initial assessment for in-patients) and at 24 hours. We will not require any additional volume of blood at these time points. In particular, no extra blood will be drawn before the blood transfusion. As described above, however, an additional blood test (2ml volume) is required midway through the transfusion. A summary of the clinical procedures, blood sampling and laboratory tests required for the study is given below. Blood sampling and/or additional tests outside this schema may be required for clinical reasons.

Summary of clinical and laboratory procedures

TIME	ACTIVITY	CLINICAL ASSESSMENT	HAEMATOLOGY	BIOCHEMISTRY	BLOOD FILM
	ADMISSION	●	FBC	UEC, CA, VBG, GLU	●
0 HRS	START TX	●			
+2 HRS				UEC, CA	
+4 HRS	END TX				
+6 HRS		●			
+24 HRS		●	FBC	UEC, VBG, GLU	●
		D I S C H A R G E			
28 DAYS		●	FBC		●

KEY: FBC Full Blood Count; UEC Urea, electrolytes, creatinine; VBG Venous blood gas; CA Calcium

g. Safety monitoring

Safety review committee

The safety review committee (SRC) will consist of a local safety monitor (LSM) and an external panel. The LSM is Dr J. Berkley, a consultant paediatrician based at KEMRI CGMR-C. The external panel consists of three members; Dr S. Wanjohi (Consultant paediatrician, CPGH), Dr M. English (Consultant paediatrician, KEMRI Nairobi) and Dr. M. Boele van Hensbroek (Consultant paediatrician, Liverpool School of Tropical Medicine and University of Amsterdam).

Adverse events

An adverse event (AE) is defined as any untoward medical occurrence. These will be fully documented in the Case Report Form (CRF) and graded according to intensity (mild, moderate, severe) and likelihood of relationship

with the packed cord red blood cell transfusion (not related, unlikely, suspected, probable).

Serious adverse events

A serious adverse event (SAE) is defined as any adverse event, which may or may not be related to the packed cord red blood cell transfusion, that results in:

1. Death
2. A life-threatening event
3. Persistent or significant disability
4. Prolongation of hospitalisation

Any SAE will be fully documented by the principal investigator and reported by telephone, fax or email to the SRC and the National Ethics Committee (NEC) within 24 hours. All SAEs will be discussed with the SRC, the principal investigator and co-investigators to determine an appropriate response. This could result in discontinuing the study, amending the protocol or continuing with no amendment.

Suspected Unexpected Serious Adverse Reaction (SUSAR)

A SUSAR differs from an SAE in that it is unexpected and thought to be related to the intervention under investigation. Any SUSAR will be reported to the SRC and NEC within 24 hours. The trial will be suspended and may only be resumed, if appropriate, after a safety review has been completed.

9. DATA MANAGEMENT AND SECURITY

Rapid determination of the availability of packed cord red blood cells will be enabled by a cord blood inventory system accessible via the intranet. This is currently under development. A CRF will be developed to capture the demographic, clinical and laboratory data required to achieve the primary and secondary objectives. Data will also be entered onto an electronic database and, where possible, data fields will be limited by legal values and ranges. Case report forms will be stored in a locked filing cabinet, computers and computer files will be password protected.

10. TIME FRAME (Expected duration: 6 months to 1 year)

The study will commence once the necessary approvals are obtained and continue until the either the required number of children has been recruited or the trial is stopped.

11. ETHICAL CONSIDERATIONS

Consent for cord blood donation

The consent process for cord blood donation is described in Appendix B and the information sheets and consent form (English and Kiswahili) are contained in Appendix E.

Consent for cord blood transfusion

As described in Section 8f, the initial part of the consent process for this study, is integral to the recruitment algorithm. This is so that all the information required by the child's carer to make an informed decision on whether to participate in the study has been imparted and discussed by the time a clinical decision on whether to transfuse the child has been made. Additionally, written consent will not be sought until and unless cord blood is available for the child. In this way the decision to enter the trial will be fully informed but will not delay treatment and children will not be consented to receive an intervention, which is subsequently not available.

If, for whatever reason, the decision to transfuse is made before this part of the consent process is complete then the child will not be ineligible for the study (see exclusion criteria). As in any robust consent process, the information sharing and checking of understanding will not cease after the signing of the consent form. The child's carer will have the opportunity to withdraw from the study without prejudice at any stage.

English and Kiswahili versions of the information sheet and consent agreement are contained in Appendix F. These will be translated into Kigiriama. The information sheet may be read and kept by the carer of a child

for whom consent to enter the study is sought, but it also serves as a template for the fieldworkers in face-to-face discussions with carers.

Confidentiality

All clinical and laboratory data related to the study will be kept securely as described in Section 9.

Inducement

No financial incentives will be offered to enter the study. The intensive clinical observation within the first 24 hours of cord blood transfusion and the 28-day follow up appointment could be perceived as a benefit of the study, but are consistent with accepted levels of care for the severely anaemic child. Travel costs to attend for follow-up will be reimbursed.

12. EXPECTED APPLICATION OF THE RESULTS

The results of this study will inform a decision on whether and how to proceed to a comparative trial comparing the transfusion of cord and adult-donated blood in children with severe anaemia.

13. ROLES OF THE INVESTIGATORS

All the investigators have contributed to the design of the study. Lewa Pole and Patrick Wambua will oversee laboratory activities at the RBTC, Mombasa. Johnstone Thitiri will assist in the co-ordination of the trial. Oliver Hassall is responsible for the overall conduct of the trial.

14. BUDGET (1 USD=75 KES)

	KES	USD
a. *Personnel*	1 382 930	18 440
b. *Patient costs and/or supplies*	1 350 000	18 000
c. *Equipment*	472 500	6 300
d. *Travel and accommodation*	Nil	Nil
e. *Transportation*	Nil	Nil
f. *Operating expenses*	270 000	3 600
g. *Animal expenses*	Nil	Nil
h. *Consultancy fees*	Nil	Nil

i. *Contingency funds (15%)*	521 315	6 950
Total	**3 996 745**	**53 290**

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APPENDIX A

SAFETY AND EFFICACY OF PACKED CORD RED BLOOD CELL TRANSFUSION FOR SEVERE ANAEMIA

SAFETY DATA

This document provides safety data relating to the risk of transfusion transmitted infection in cord blood generated by the current phase of the study (SSC Protocol 1032). It also gives further detail about the post-collection processing of cord blood and, in particular, anti-coagulant/preservative ratios.

A. Transfusion Transmitted Infections

Transfused blood is a potential source of infection to the recipient. The consequences of a transfusion-transmitted infection (TTI) may be acute and/or chronic and cause death and/or disability. Reducing the risk of TTI is a major function of blood transfusion services and involves the recruitment and retention of voluntary non-remunerated donors, screening donors with health questionnaires, and screening donations with laboratory assays.

HIV, HBV, HCV, Syphilis

The TTIs for which blood for transfusion should be routinely screened in the laboratory are HIV, HBV, HCV and syphilis. The sensitivity of these tests is such that, in developed countries at least, the risk of infection is very small (Brecher & Hay 2005) although in countries with weaker health systems the risk may be considerably greater (Moore *et al.* 2001).

In Coast Province, blood for transfusion is donated by both voluntary and replacement donors. The majority of voluntary donors are secondary school children and students at higher education establishments. This population is considered to have a lower prevalence of TTI than replacement donors, which are usually family or friends of the patient receiving the blood transfusion. This is borne out from data from the Regional Blood Transfusion Centre in Mombasa.

The higher the prevalence and incidence of a particular TTI in a blood donor population, the higher the residual risk of infection. Residual risk conventionally refers to false negative results from laboratory screening tests either due to the serological 'window period' or insensitivity of the test. In our setting this definition should be broadened to also include human and laboratory error and resource limitations (Moore *et al.* 2001).

Although cord blood is fetal in origin, from the perspective of TTI the mother should be considered the donor; it is biologically implausible for cord blood to contain the infective agents of HIV, HBV, HCV or syphilis without vertical transmission from mother to baby. Delivering mothers are likely to be older than voluntary blood donors in Coast Province and have, by definition, practiced unprotected sex. Prevalence rates of TTI may, therefore be higher in this population. Conversely, HIV and syphilis screening is an integral part of routine antenatal care, and cord blood is only donated by mothers who have screened negative for these conditions in the preceding pregnancy. A comparison of the prevalence rates of TTI in blood donations received by the RBTC and cord blood donors in Phase 2 of the cord blood project (SCC protocol 1032) are shown in the table below.

Table 1 Prevalence and odds ratios of TTI in RBTC and cord blood donors

TTI	Prevalence (%) RBTC	Prevalence (%) Cord donors	Odds ratio (95% CI)	Placental transmission
HIV	3.5	1.9	1.9 (0.8-4.7)	MED
HBV	7.4	3.0	2.6 (1.3-5.2)	LOW
HCV	3.8	0.8	5.0 (0.7-36.3)	LOW
Syphilis	1.7	0.7	2.3 (0.6-9.4)	HIGH
TOTAL	16.4	6.4	2.9 (1.8-4.8)	N/A

Overall in our survey, the odds of a TTI infection in a conventional blood donor are 2.9 times higher than cord blood donors. This will translate into an odds ratio for residual risk. This may be an underestimate of the risk at Kilifi

District Hospital, where the proportion of replacement donors is likely to be higher and screening may not be as effective.

Placental transmission rates of less than 100% (see table) reduce further the residual risk of TTI by cord blood transfusion as the cord blood will not inevitably be infective if a positive mother has a false negative screening test.

Bacterial contamination

Bacterial contamination of blood products may occur as a result of unrecognised or sub-clinical bacteraemia in the donor but is more likely at the time of collection or processing. It is influenced by factors such as donor screening, skin preparation, cold chain and refrigeration, duration of blood storage and component preparation. Transfusion of blood contaminated with bacteria with pathogenic potential can cause septicaemia, endotoxic shock and death.

Prospective cultures of whole blood or red cells at the time of collection in developed countries have shown contamination rates of 2-4/1000 although transfusion-associated infections are much more rare (Brecher & Hay 2005). Hitherto, contamination rates of blood of blood for transfusion in sub-Saharan Africa have not been investigated.

Bacterial contamination of umbilical cord blood, particularly with gram-negative perineal and bowel flora has been a major concern in the context of cord blood transfusion (Hassall *et al.* 2003). The main purpose of the current phase of the cord blood project (SSC #1032) has been to compare the rate and nature of bacterial contamination of cord blood with that of adult-donated blood in our setting. All blood for transfusion at CPGH is provided by the RBTC in Mombasa.

In the ongoing study protocol, ‘normal’ adult-donated blood is sampled as it leaves the Coast Provincial General Hospital (CPGH) blood bank to be transfused to a child on the paediatric wards. These units have therefore been

stored for varying lengths of time between collection and transfusion. The length and conditions of blood storage influence the rate and profile of bacteria isolated and each cord blood unit collected is paired with a cultured adult-donated unit and sampled and cultured at the same time interval. As a consequence, the culture results of cord and adult-donated blood cultures are indicative of that near the time of transfusion.

Cord blood is stored in the RBTC under the same conditions as adult-donated blood and cord blood units are sampled in an identical fashion. All cultures are performed by project staff and we have fully functioning and documented internal quality control processes, including for media sterility and support. The KEMRI-CGMRC/WTRL microbiology lab provides external quality control and supervision. Interim results are shown in the table below.

Table 2 The proportion of adult-donated and cord blood units from which bacteria have been isolated- SSC 1032 interim results (CONFIDENTIAL)

	Adult blood	Cord blood	
TOTAL CULTURED	331	247	
DAYS (Median/range)	17 (0-43)	17 (0-39)	
No. POSITIVE	34	11	
% (95% CI)	10.3 (7.3-14.2)	4.5 (2.2-7.8)	p<0.01 (Chi-squared)

These data show that the odds of bacterial contamination at the time of transfusion are 1.8 times greater for an adult-donated unit than a cord blood unit (Odds ratio; 95% CI 1-3.3). Bacteria contaminating blood for transfusion have differing capacities to do harm. We have addressed this by asking a panel to independently grade the isolates into those with high and low pathogenic potential. There was very good agreement between members of the panel and the results are illustrated below.

Table 3 Organisms isolated from culture of adult-donated and cord blood- SSC 1032 interim results (CONFIDENTIAL)

	Adult blood	**Cord blood**	Odds ratio (95% CI)
No. of cultures	331	247	
High pathogenic potential			
Aeromonas hydrophila	1	0	
Aeromonas salmonicida	0	1	
Aeromonas sobria	1	0	
Enterobacter cloacae	0	0	
Enterobacter sakazaki	1	0	
Enterobacter spp.	1	0	
Klebsiella pneumoniae	3	0	
Pseudomonas aeruginosa	3	0	
Pseudomonas cepacia	1	0	
Streptococcus Gp B	0	1	
Streptococcus Gp D	0	1	
Xanthomonas maltophilia	0	1	
Sub-total	11	4	
% of cultures	3.3	1.6	3.8 (1.2-12.1)
Low pathogenic potential			
Acinetobacter spp.	1	0	
Bacillus spp.	6	4	
Micrococcus spp.	1	1	
Ochrobacter anthropi	1	0	
Onigella urethralis	1	0	
Pseudomonas fluorescens	1	0	
Pseudomonas picketti	1	0	
Pseudomonas stutzeri	2	0	
Pseudomonas vesicularis	1	0	
Shewanella putrefaciens	5	0	
Staphylococcus epidermidis	6	0	
Sub-total	26	5	
% of cultures	7.9	2.0	4.1 (1.6-10.9)
Unknown pathogenic potential			
GNR unidentified	2	3	
Fungus identified	0	1	
Sub-total	2	4	

Screening

An additional objective of protocol #1032 was to ascertain the sensitivity of a culture performed soon after collection as a means of screening for bacterial contamination at the time of transfusion. Thus cord blood units are sampled using a sterile connecting device a median of 2 days after collection. Interim results are shown below:

Table 4 The number of UNITS screening positive and negative for all bacterial isolates at first and second culture

	CB2 POS	**CB2 NEG**	TOTAL
CB1 POS	**2**	**7**	9
CB1 NEG	**8**	**211**	219
TOTAL	10	218	228

Sensitivity: 20% Specificity: 97%

Table 5 The number of UNITS screening positive and negative for bacterial isolates of HIGH pathogenic potential at first and second culture

	CB2 POS	**CB2 NEG**	TOTAL
CB1 POS	**2**	**0**	2
CB1 NEG	**2**	**224**	226
TOTAL	4	224	228

Sensitivity: 50% Specificity: 100%

The sensitivity of screening culture for any isolate is 20% however this rises to 50% for isolates that have a high pathogenic potential. All nine units that were positive at first culture, including the two that were later positive at second

culture, were positive after 2 days of incubation and had a positive gram stain of the culture broth. We suggest therefore that if screening of cord blood collections should continue into the clinical trial phase the method should be 48-hour incubation and gram stain. Such screening would decrease the chance of receiving a bacterially contaminated cord blood unit still further.

Multiple units

Every individual unit of transfused blood carries risk. This is not just associated with TTI but also other, usually immunological, complications. The latter are rare and likely to be comparable in adult-donated and cord blood. On the basis of the above data, we suggest that in circumstances where the volume of cord blood required by a child exceeds the volume of one unit, the receipt of two units would place the child at no greater risk of suffering a transfusion complication than if it received blood from a single adult-donated unit.

B. Processing of cord blood collections for transfusion

Both adult and cord blood is collected into bags of fixed volume containing a fixed volume of anti-coagulant/preservative (AP). The National Blood Transfusion Service in Kenya, like many others, uses Citrate-Phosphate-Dextrose-Adenine (CPD-A1). For adult-donated blood the bag volume is 450ml and CPD-A1 volume 63ml, giving a blood to CPD-A1 ratio of 7:1. Adult blood collections of less than 300ml in which the blood to CPD-A1 ratio is 5:1 are not used because of the risk of citrate toxicity (hypocalcaemia through chelation of ionized calcium). When such units are transfused to children at the recommended 20ml/kg, the dose of CPD-A1 received by the child is 3.5ml/kg (See Table 6).

For our cord blood collections, we also use a primary collection bag containing CPD-A1. In this case the volume of CPD-A1 is 21ml, which is an appropriate amount for a final blood/AP ratio of 7:1 for a 150ml cord blood collection. The volume of blood collected, however, is unpredictable and usually less than 150ml. Research and development is underway on a device

that adjusts the volume of CPD-A1 added to a cord blood collection at the time of collection, but no such device is yet on the market.

The consequences of greater concentrations of CPD-A1 are two-fold. Firstly, the dose of citrate received by a child receiving cord blood may be too high, resulting in citrate toxicity. Secondly, red cell storage may not be as effective, resulting in red cell haemolysis. This will reduce the number of red blood cells available to the transfused patient and increase the concentration of extra-cellular potassium in the donation.

Producing packed cord red blood cells is likely to address at least one of these issues. Separating the cord blood into its component red cells and plasma by centrifugation or sedimentation and removing the red cells reduces the total volume of CPD-A1. Furthermore, the greater concentration of red cells means that less volume is required to deliver the same amount of haemoglobin and the total volume of CPD-A1 is reduced.

Packed cells will be produced by storing the cord blood units upright and releasing the red cells at the bottom of the bag into a burette after compatibility testing and before transfusion. The actual volume of packed cord red blood cells issued for transfusion will vary and be dictated by the following parameters:

- *The quantity of haemoglobin transfused*. The total Hb content of a 500ml unit of whole blood produced by the RBTC in Mombasa is approximately 50g. Thus the 20ml/kg normally transfused to a child contains around 2g of haemoglobin. For each unit of cord blood we will know the Hb of the cord blood and the volume collected and thus the total Hb content of the red cells. We intend to transfuse whole units and to select those, which will deliver a minimum of 2g/kg of haemoglobin. This translates into a 2.5g/dL rise in haemoglobin.

- *The CPD-A1 concentration*. As stated above, the maximum dose of CPD-A1 transfused to a child receiving a unit of conventional blood is 3.5ml/kg. We will assume that the CPD-A1 is distributed evenly throughout a sedimented cord blood unit and not transfuse a volume of red cells in which the volume of CPDA-1 excedes 3.5ml/kg.

- *The volume of whole blood that would be transfused.* It is possible that in some circumstances the volume of packed cord red blood cells as determined by the above two parameters may excede the volume of whole blood that the child would have received. Usually this is 20ml/kg but is reduced to 10ml/kg in children with severe malnutrition. We will not excede these volumes.

The trial will monitor for excessive citrate transfusion by measuring serum calcium midway through the transfusion.

Bifano *et al.* (1994) demonstrated that whole cord blood tolerated well storage for 28 days in blood/CPD-A1 ratios of between 2:1 to 8:1. Yet there is evidence that in autologous adult blood collections haemolysis is increased at higher concentrations of CPD-A1 (Cober *et al.* 2001). The only previous documented experience is with cord red blood cells which were stored as packed cells and produced using a different processing method than the one available to us (Garritsen *et al*. 2003). Cord blood was collected into CPD and then concentrated packed red cells produced by expressing red cells from the bottom of the primary bag after centrifugation. Extended storage medium (SAG-mannitol) was then added to the red cells. Red cell storage was compared with adult-donated blood packed red cells prepared in a similar manner and no significant differences were found. The bag configuration used to do this is no longer in production.

Before the start of any trial of cord blood transfusion, we will assess the red cell storage parameters of packed cord red blood cell units produced from

different cord blood volumes at 7, 14, 21, 28 and 35 days storage. These will be compared with the same parameters in samples from adult-donated blood units stored at the RBTC in Mombasa.

C. Packed red blood cell transfusions for severe anaemia

In developed countries where components are routinely produced from blood donations, red cell transfusion is the norm for severe anaemia. Indeed, current international guidelines for the transfusion of children with severe anaemia in resource-limited settings recommend the transfusion of packed red blood cells over whole blood (WHO 2001, p 277). The reality, however, is that component preparation is limited and whole blood is usually transfused.

There is evidence, however, that hypovolaemia may be a significant factor in some children with severe anaemia. In this proposed study, children with severe anaemia fulfilling criteria for blood transfusion that have clinical evidence of hypovolaemia will be excluded.

Appendix A References

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APPENDIX B

CONSENT AND LABORATORY PROCEDURES FOR CORD BLOOD DONATIONS IN MOMBASA

During the course of the previous phase of this project (described in SSC 1032), we have developed systems for the collection, screening and processing of cord blood donations in Mombasa. These systems involve activities at both Coast Provincial General Hospital (CPGH) and the Regional Blood Transfusion Centre (RBTC).

Consent process for cord blood donation at CPGH

The consent process for cord blood donation that we have developed involves seeking consent from mothers in two stages. This is in line with practice in Northern countries where cord blood is collected for stem cell harvest (Vawter *et al.* 2002). During the first stage, eligible mothers are approached on the labour ward at CPGH *before* their delivery and verbal consent is sought to collect the cord blood from their placenta. The information conveyed to the women at this stage is given in Information Sheet 1 (Information Sheet 1, Appendix E). The consent is sought in Kiswahili in the privacy of a delivery cubicle by a trained fieldworker and a picture is used to help understanding of cord blood (Appendix E).

The second stage of the consent process occurs after the cord blood has been collected and the mother has had a chance to recover from the delivery. At this point she is more comfortable and able to absorb and process information more easily. The second stage of the consent process involves a revision of the information conveyed during the first stage and then a more detailed discussion on the purpose of the donation and the screening process (Information Sheet 2, Appendix E). Again, consent is sought in Kiswahili in the privacy of a delivery cubicle by a trained fieldworker and a picture is used to help understanding. If consent is given a consent agreement is signed at the end of this process (Consent Agreement, Appendix E). If the woman does *not* consent to donate cord blood at this stage the unit is discarded.

Cord blood screening

The screening and grouping of cord blood is integrated within the service provided by the Regional Blood Transfusion Centre in Mombasa. A *maternal* serum sample is screened for HIV, hepatitis B, hepatitis C and syphilis. HIV, hepatitis B and hepatitis C are screened for using highly sensitive enzyme-linked immunosorbant assay (ELISA) techniques. Syphilis is screened for using a non-treponemal flocculation test for the detection of regain antibodies (RPR). Any cord blood unit for which there is a reactive result for any of the screening tests is discarded.

Blood samples and cord blood units are identified by a unique donor number and only designated members of the study team can link test results with individuals. We offer a results service including post-test counselling and appropriate referral.

Cord blood grouping

A sample of cord blood from the pilot tube of each donated unit is grouped by the RBTC using standard techniques for the determination of ABO and Rhesus D blood groups. Cord red cells are tested against anti-A, anti-B and anti-D monoclonal reagents. Reverse grouping of cord blood red cells is not undertaken because naturally occurring anti-A and anti-B antibodies are absent in cord blood.

All cord blood donations are also screened for the presence of bacteria. A sample of the unit is inoculated into a liquid phase growth medium and incubated at 37 deg C. After 48 hours a thin film is made, stained with Grams stain and examined by high power microscopy for the presence of micro-organisms. We have shown previously that this technique will detect the presence of bacteria with a high pathogenic potential with a sensitivity of 50% and a specificity of 100% (see Appendix A).

Cord blood processing

As described in Appendix A, cord blood will be transfused as packed red cells. This will be achieved by storing the units upright so that the red cells sink to

the bottom of the pack by sedimentation. At the time of transfusion, the red cells are transferred to a burette by gravity leaving the supernatant in the primary bag. This will be undertaken by laboratory staff at Kilifi District Hospital and requires only minor modification to the method that is currently employed to transfer the small volumes of blood required for paediatric transfusion from the primary bag to a burette.

Appendix B References

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APPENDIX C- Consent documents for Cord Blood DONATION

The safety of umbilical cord blood as a source of blood for transfusion for young children with severe anaemia in Coast Province, Kenya

INFORMATION SHEET (1)

WHO ARE YOU?

We work with the Kenya Medical Research Institute (KEMRI). KEMRI is part of the Ministry of Health and does research to find out more about illness and health in Kenya, to try and find ways to make the health of people in Kenya better.

The research project we are doing involves all the staff in maternity here at Coast General but for a few of us it is our full-time job. We are the *Wazo Geni* team and our names are:

Dr Oliver Hassall, Mr Johnstone Thitiri, Ms Martha Musyoki , Ms Mary Kirimo, Ms Phyles Maitha and Mr Paul Kyalo.

WHAT IS THE RESEARCH PROJECT YOU ARE DOING?

There is a shortage of blood for transfusion in Kenya. One result of this is that young children in hospital who need a blood transfusion may not get blood when they need it. Some children may die as a result of this. We are looking at a new way of making the supply of blood better for these children.

After a baby, like the one you are going to have soon, is born the midwife clamps the umbilical cord and then cuts it before the baby can be given to the mother (See picture). A small amount of baby's blood is left in the veins of the cord that is left behind and in the placenta (See picture). This is the baby's blood and is good blood but the baby does not need it anymore and it is normally disposed of with the rest of the after-birth. But, it is possible to collect this blood before it is disposed of and our project is looking at whether this blood can be used to transfuse to young children who need a blood transfusion.

We are asking you, and women like you who are about to have a baby, whether we can collect this blood.

WHAT WILL HAPPEN IF I ACCEPT?

If you agree to take part in the study, you will then continue your labour and deliver your baby completely as normal. After you have had your baby and the after-birth has been delivered, we will try and collect the blood that is left in the after-birth. We will do this on the Labour Ward but away from the place where you have the baby. After we have collected the blood, the rest of the after-birth will be disposed of in the careful way it is normally done here. Sometimes it is not always possible for us to collect the blood.

WHAT WILL YOU DO WITH THE BLOOD AFTER YOU HAVE COLLECTED IT?

If we are able to collect the blood, we will not do anything with it until we have talked to you again. This will be after you had had your baby and had some rest. We think that it is better to talk when you are more comfortable and we will not do anything with the blood that we do not discuss with you.

ARE THERE ANY RISKS TO MY BABY OR ME?

Collecting this blood does not interfere in any way with the normal birth process and there is no risk to you or your baby.

DO I HAVE TO TAKE PART IN THE STUDY?

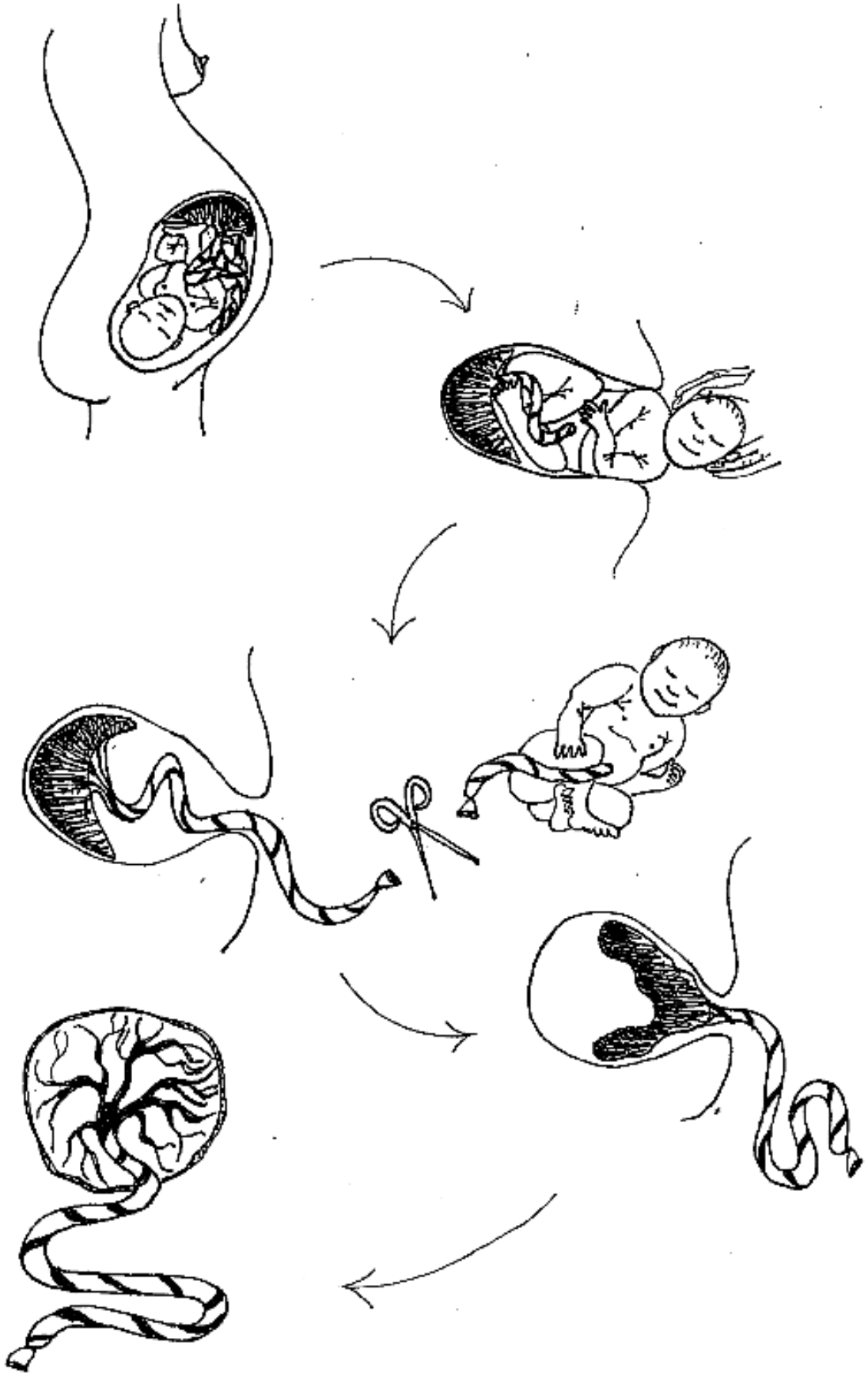
It is completely your decision whether or not you decide to take part. If you do not wish to take part it will not affect the normal medical care that you receive in any way. If you do decide to take part, there are no direct personal benefits to you and you can change your mind at any time.

WILL I BE ASKED TO SIGN ANYTHING?

Not at this stage. If you agree to donate the baby blood from your after-birth, we will ask you to sign a consent form after we have spoken to you again after you have had your baby.

WHAT DO I DO IF I HAVE ANY QUESTIONS?

One of our study team will discuss all the issues with you before they invite you to take part in the project. You may ask questions then or at any stage.



The safety of umbilical cord blood as a source of blood for transfusion for young children with severe anaemia in Coast Province, Kenya

INFORMATION SHEET (2)

Thank you again for agreeing to take part in the research project, which we talked to you about before you had your baby. We were able to collect blood from the umbilical cord and placenta after your delivery.

Now that you have had your baby and are more comfortable, we would like to give you some more information on what we would like to do with the blood.

WHAT IS THE BLOOD YOU HAVE COLLECTED?

The blood we have collected is the blood from your baby's umbilical cord and placenta (See picture). The baby does not need this blood anymore and it would normally have been disposed of with the rest of the after-birth.

WHY DID YOU COLLECT IT?

We collected this blood because there is a shortage of blood for transfusion in Kenya. One result of this is that young children in hospital who need a blood transfusion may not get blood when they need it. Some children may die as a result of this. We are doing a research project to see whether the baby blood that we have collected from your after-birth can be given to another child who is sick and needs a blood transfusion.

WHAT WOULD YOU LIKE TO DO NOW?

We would like to make the blood that you have donated available to a sick child who needs a blood transfusion. Before any blood can be given to a patient it must be tested to see whether it is free from infections that can be passed by blood transfusion. These infections are hepatitis, syphilis and HIV. All blood that is donated for transfusion is tested for these.

The only way that baby blood can have these infections is if they have been passed from the mother. The tests for these infections do not work on the baby blood, so the only way to check that the blood is safe is to test the mother. We would like to test you for these infections.

HAVEN'T I ALREADY HAD SOME OF THESE TESTS?

Yes you have. During your antenatal care you were tested for HIV and syphilis and were negative for both. We still need to do a blood test now so that we can check that the results are correct and also test for hepatitis, which you have not been tested for.

WHAT WILL HAPPEN IF I AGREE TO THE TESTS ON ME?

If you agree to us testing your blood, we will counsel you first and then draw a teaspoon of blood from your arm to use for the tests. After we have done the tests we would not use any of the blood for anything apart from what we have talked about. We would not let anyone else have the blood and we would dispose of it carefully ourselves.

CAN I GET THE RESULTS OF THE TESTS?

Yes. After we have done the tests you can come and get the results. This would be after you have gone home and the details of how to do this are given at the bottom of this page. If you do come back for your results and any of the tests for infection are positive we can refer you and your baby to the right clinic in the hospital if you wish. Otherwise the results of any tests will be completely confidential and known only by a doctor, a nurse and a counsellor on the study team.

DO I HAVE TO TAKE PART?

If you decide now that you do not want to take any further part in the study, we will throw away the blood that we have collected. This decision will not affect your normal medical care in any way. If you do decide to take part, there are no direct personal benefits to you and you can change your mind at any time.

WILL I BE ASKED TO SIGN ANYTHING?

Yes. If you agree to donate the baby blood from your after-birth, we will ask you to sign a consent form to show that you understand what we have talked about and agree to take part. This is normal for all research projects.

WHAT DO I DO IF I HAVE ANY QUESTIONS?

One of our study team will discuss all the issues with you before they invite you to continue taking part in the project. You may ask questions then or at any stage.

– –

YOUR DONOR NUMBER: |__|__|__|__| - |__|

GETTING YOUR TEST RESULTS

If you wish to get the results of your blood tests or your baby's, please contact Phyles Maitha to make a private appointment with one of the study team counsellors. Phyles may be contacted at:

Wazo Geni Team
Regional Blood Transfusion Centre
PO Box 91036
Mzizima Road
Mombasa (*next to Coast General Hospital*)

Phone or text: 0725 722676

IMPORTANT: You will need to bring this paper with you to the appointment as it shows your unique donor number, which will help us to identify you correctly.

Remember, the test results are yours and will not be shared with anyone outside the study team without your permission.

CONSENT AGREEMENT

I, _____ , confirm that I have been informed about the study entitled:

The safety and efficacy of packed cord red blood cell transfusion for severe anaemia in children in a Kenyan hospital

which is under the direction of Dr. Oliver Hassall.

I have been provided with information concerning the study, which is looking at the idea of collecting and using blood from umbilical cords for children who need a blood transfusion.

I confirm that I have been fully counselled about the nature of the investigations that will be performed as part of this study. I understand that the results of all tests will be known to the research team only and will remain confidential. I have been given information so that I may receive the results of the tests if I so wish.

The implications, duration, purpose, voluntary nature and inconveniences or risks that may reasonably be expected have been explained to me by:

_____ *(name of person taking consent).*

I have been given the opportunity to ask questions concerning the study and these have been answered to my satisfaction. If I have further questions, I may contact:

Oliver Hassall, Wazo Geni team	041 522063, 0723 495943
Johnstone Thitiri, Wazo Geni team	041 522063, 0722 408020
Dorcas Kamuya, KEMRI	041 522063
Ambrose Rachier, NEC	0722 205901, 0733 400003

I understand that I may at any time during the study revoke my consent without loss or penalty.

Yes, I agree to take part in this study

Signature: _____ Date ____ / ____ / _____

or thumb print of donor

Signature: _____ Date: ___ / ____ / _____

of person taking consent

Usalama na ubora wa damu kutoka kwa kitovu na kondo la uzazi kwa uongezaji damu kwa watoto wenye upungufu mkubwa wa damu katika hospitali moja nchini Kenya.

UJUMBE (1)

SISI NI KINA NANI?

Tunafanya kazi na shirika la KEMRI. KEMRI ni moja wapo ya idara ya wizara ya afya, inayofanya utafiti kuhusu magonnjwa na hali ya afya nchini Kenya, na kutafuta mbinu za kuboresha afya kwa watu wa Kenya.

Mradi tunaofanya unahusisha wafanyi kazi wote wa maternity hapa hospitalini, na pia wachache ambao ni wahusika wakuu katika mradi huu. Sisi ni timu ya *WAZO GENI* na majina yetu ni:-

Dkt Oliver Hassall, Mr Johnstone Thitiri, Ms Martha Musyoki, Mrs Mary Masha, Ms Phyles Maitha na Paul Kyalo.

NI MRADI GANI TUNAOUFANYA?

Kuna upungufu wa damu hapa nchini Kenya. Moja wapo ya matokeo ya uhaba huu ni kwamba watoto wadogo walio hospitalini ambao huhitaji kuongezwa damu, huikosa wakati inapohitajika. Watoto wengine hufa kwa sababu hii. Tunachunguza njia mpya ya kutosheleza mahitajii ya damu kwa watoto hawa.

Baada ya mtoto kama yule unayetarajia kuzaliwa, mkunga hufunga na kisha kukata kitovu kabla ya mtoto kupatiwa mamake (Angalia picha). Kiwango kidogo cha damu hubakia katika mishipa ya kitovu kilichobakia na kondo la uzazi (Angalia picha). Damu hii ni ya mtoto na ni nzuri lakini mtoto huwa haihitaji tena na kawaida hutupwa pamoja na kondo la uzazi. Lakini kuna uwezekano wa kuitoa damu hii kabla kutupwa na mradi wetu unaangalia kama damu hii inaweza kuongezwa kwa watoto walio na uhaba wa damu katika siku za usoni.

Tunakuuliza wewe, na wanawake wengine kama wewe wanaotarajia kupata mtoto, kama tunaweza kuchukua damu hii.

NI NINI KITAFANYIKA NIKIKUBALI?

Ukikubali kushiriki kwa mradi huu, utaendelea na uchungu na baadaye kujifungua mtoto kwa njia ya kawaida. Baada ya kujifungua mtoto wako, na kondo la uzazi kutoka tutajaribu kuchukua damu iliyobaki kwa kondo la uzazi. Tutafanya hivyo katika wodi ya kujifungulia lakini mbali na chumba ulichojifungulia. Baada ya kuchukua damu hiyo, kondo la uzazi litatupwa kwa njia ya kawaida inayotumika hapa hospitalini. Wakati mwingine huwa haiwezekani sisi kuweza kuchukua hiyo damu

MTAFANYIA NINI DAMU BAADA YA KUICHUKUA?

Tukiweza kuchukua hiyo damu, hatutaifanyia chochote hadi tuzungumze na wewe tena. Hii itakuwa baada ya wewe kujifungua na kupumzika kidogo. Tunafikiri ni vyema kuongea nawe wakati umetulia zaidi, na hatutafanya lolote na hiyo damu kwa kitu ambacho hatutakuwa tumekueleza.

KUNA HATARI YEYOTE KWANGU AMA KWA MTOTO WANGU?

Kuchukuliwa kwa damu hii hakutatizi hali ya kawaida ya kujifungua, na hakuna hatari yeyote kwako ama kwa mtoto wako. Damu hii itachukuliwa baada ya kondo la uzazi kutoka, na itafanywa mbali na chumba cha kuzalia.

NI LAZIMA NISHIRIKI?

Uamuzi wako ni wa hiari iwapo utashiriki au la. Ikiwa hautapenda kushiriki uamuzi wako hautatatiza huduma za afya unazozipata kwa njia yeyote. Ukiamua kushiriki hakutakuwa na faida za kibinafsi kwako na unaweza kubadili nia wakati wowote.

JE NITAULIZWA KUWEKA SAHIHI?

Sio wakati huu, iwapo utakubali kutoa damu kutoka kwa kondo la uzazi, basi tutakuuliza kuweka sahihi fomu ya makubaliano baada ya kuzungumza na wewe tena baada ya kujifungua.

NITAFANYA NINI NIKIWA NINA MASWALI YEYOTE?

Mmoja katika washiriki wa mradi huu atakueleza kila kitu kabla ya kukuuliza ushiriki kwenye mradi unaweza kumuuliza maswali wakati huo au hata wakati wowote ule.

Usalama na ubora wa damu kutoka kwa kitovu na kondo la uzazi kwa uongezaji damu kwa watoto wenye upungufu mkubwa wa damu katika hospitali moja nchini Kenya.

UJUMBE (2)

Asante tena kwa kukubali kushiriki katika mradi wetu ambao tulikuzungumzia kuuhusu kabla hujapata mtoto wako. Tuliweza kutoa damu kutoka kwa kitovu na kondo la uzazi baada ya kujifungua.

Kwa vile sasa umepata mtoto na umepumzika kidogo, tungelipenda kukupatia ujumbe zaidi kuhusu ninini tungelitaka kufanya na hiyo damu.

NI DAMU GANI MLIYOCHUKUA?

Damu tulio ichukua ni damu kutoka kwa kitovu na kondo la uzazi la mtoto wako. Mtoto haihitaji damu hii tena na kawaida ingetupwa pamoja na kondo la uzazi.

KWA NINI MLIICHUKUA?

Kuna upungufu wa damu nchini Kenya. Mojawapo ya matokeo haya ni kwamba watoto wadogo walio hospitalini ambao wanahitaji kuongezwa damu huenda wasipate damu wanapoihitaji. Watoto wengine wanaweza kufa kwa sababu hiyo.

Tunafanya mradi wa utafiti, kuona kama kwamba damu ya mtoto ambayo tumeichukua kutoka kondo lako la uzazi inaweza kuongezewa mtoto mwingine ambaye ni mgonjwa na anahitaji kuongezewa damu.

NININI MNATAKA KUFANYA SASA?

Tungelipenda kufanya damu ambayo umetoa tayari kutumika kwa mtoto mgonjwa anayehitaji kuongezwa damu. Kabla damu yoyote haijaongezwa kwa mgonjwa, nilazima ipimwe kuona kwamba haina maambukizo yoyote yanayopitishwa kwa damu. Maambukizo haya ni: - ugonjwa wa maini, kaswende, na virusi vya ukimwi.

Damu yeyote ambayo hutolewa kwa madhumuni ya kuongezwa watu hupimwa haya magonjwa.

Njia pekee ambayo damu ya mtoto inaweza kupata maambukizo haya ni kupitia kwa mama. Vipimo vya maambukizo haya haviwezi kupatikana kwa damu ya mtoto,na kwa hivyo njia ya pekee kuthibitisha usalama wa hii damu ni kupima damu ya mama. Tungelipenda kukupima wewe maambukizo haya.

JE, KWANI SIJAPIMWA BAADHI YA HIVI VIPIMO?

Ndio ulipimwa wakati ulikuwa ukienda kliniki. Ulipimwa virusi vya ukimwi, kaswende na hakukuwa na maradhi. Tungelipenda kufanya kipimo cha damu sasa ili kuona kama majibu yalikuwa sahihi na pia kupima ugonjwa wa maini ambao hujawahi kupimwa.

KUTAFANYIKA NINI NIKIKUBALI KUPIMWA?

Ukikubali tupime damu yako, tutakushauri kwanza halafu tutakutoa damu kiasi cha kijiko kidogo cha chai kutoka kwa mkono wako ili tufanyie uchunguzi. Baada ya kufanya uchunguzi hatutatumia damu hiyo kwa njia yoyote mbali na yale tuliyokueleza. Hatutaruhusu mtu yeyote kuchukua damu hiyo na tutaitupa kwa njia nzuri sisi wenyewe.

NAWEZA KUPATA MAJIBU YANGU?

Ndio, baada ya kufanya uchunguzi, unaweza kuja kuchukua majibu yako. Hii ni baada ya wewe kwenda nyumbani na tutakueleza zaidi jinsi ya kufanya hivyo. Utakapo rudi kuchukua majibu yako na kama kutakua na maambukizo yeyote katika uchunguzi uliofanywa kama utapenda tunaweza kukuelekeza, wewe na mtoto wako kwa Kliniki hapa hospitalini. Hata hivyo majibu ya uchunguzi huo yatakua ni ya siri na yatajulikana na daktari, mkunga na mshauri walio katika mradi.

NI LAZIMA NISHIRIKI?

Ukiamua wakati huu kuwa hutaki kushiriki katika mradi, basi tutaitupa damu ambayo tumeichukua. Uamuzi huu hautatatiza huduma unazozipata hapa hospitalini. Ukiamua kushiriki, hakutakua na faida za kibinafsi kwako na unaweza kubadili nia wakati wowote.

JE NITAULIZWA KUWEKA SAHIHI?

Ndio, ukikubali kuipeana damu ya mtoto kutoka kwa kondo la uzazi tutakuuliza uweke sahihi katika fomu ya idhini ya makubaliano ili kubainisha kwamba umeelewa tuliyoyazungumzia na kuwa umekubali kushiriki.Hii ni kawaida katika miradi yote ya utafiti.

NITAFANYA NINI NIKIWA NINA MASWALI YEYOTE?

Mmoja katika washiriki wa mradi huu atakueleza kila kitu kabla ya kukuuliza ushiriki kwenye mradi. Unaweza kumuuliza maswali wakati huo au hata wakati wowote ule.

_ _

NAMBARI YAKO YA KUTOA DAMU: |__|__|__|__| - |__|

KUPATA MAJIBU YAKO.

Ukipenda kupata majibu ya damu yako au ya mtoto wako, tafadhali wasiliana na Phyles Maitha ili kutayarisha mkutano wa kibinafsi na mmoja wa washauri walio kwenye mradi. Unaweza kuwasiliana na Phyles kwa:

Wazo Geni Team
Regional Blood Transfusion Centre
PO Box 91036
Mzizima Road
Mombasa

Simu au ujumbe mfupi: 0725 722676

MUHIMU:Utahitajika kuleta hii karatasi ya maelezo wakati wa kuja kupata majibu yako kwani inaonyesha nambari yako ya kipekee,itakayotusaidia kukujua sawa.

Kumbuka, majibu ya vipimo ni yako na hayatahusishwa mtu yeyote ambaye hayuko kwenye mradi wetu bila idhini yako.

IDHINI YA MAKUBALIANO

Mimi _____ , nathibitisha kwamba nimeelezwa kuhusu utafiti uitwao:

Usalama na ubora wa damu kutoka kwa kitovu na kondo la uzazi kwa uongezaji damu kwa watoto wenye upungufu mkubwa wa damu katika hospitali moja nchini Kenya.

ambao uko chini ya usimamizi wa Dr. Oliver Hassall.

Nimepewa maelezo kuhusu utafiti huu, ambao unatazama wazo la kuchukua na kutumia damu kutoka kwa vitovu kwa kuwapa watoto ambao wanahitaji kuongezewa damu.

Mimi ninadhibitisha kwamba, nimeshauriwa vyakutosha kuhusu namna ya uchunguzi ambao utafanywa kama sehemu moja ya utafiti huu. Mimi ninaelewa kuwa, matokeo ya vipimo vyote yatajulikana kwa washiriki wa utafiti huu pekee na yatabakia kuwa ya siri. Nimepewa maelezo ili niweze kupokea matokeo hayo kama ningependa.

Matarajio, muda, sababu, uhiari wa kushiriki na tahadhari au hatari ambayo yaweza kutarajiwa yameelezewa kwangu na:

_____ (*jina la anayechukua idhini*).

Nimepewa fursa ya kuuliza maswali kuuhusu utafiti na haya yamejibiwa hadi kuridhika kwangu. Nikiwa na maswali zaidi, naweza kumtafuta;

Oliver Hassall, timu ya Wazo Geni	522063, 0723 495943
Johnstone Thitiri, timu ya Wazo Geni	522063, 0722408020
Dorcas Kamuya, KEMRI	522063
Ambrose Rachier, NEC	0722 205901, 0733 400003

Ninaelewa kwamba naweza katika wakati wowote wa utafiti huu kuvunja idhini yangu bila kupata upungufu au adhabu yeyote.

Ndiyo, ninakubali kushiriki katika mradi huu.

Sahihi:_____ Tarehe_____/_____/_____

au alama ya kidole ya mshiriki

Sahihi _____ Tarehe_____/_____/_____

ya anayechukua idhini

APPENDIX D- Consent documents for Cord Blood TRANSFUSION

The safety and efficacy of packed cord red blood cell transfusion for severe anaemia in children in a Kenyan hospital

INFORMATION SHEET

WHO ARE YOU?

We work with the Kenya Medical Research Institute (KEMRI). KEMRI is part of the Ministry of Health and does research to find out more about illness and health in Kenya, to try and find ways to make the health of people in Kenya better. '*Wazo Geni'* is the short name for our project.

The research project we are doing involves many people here at Kilifi District Hospital but for two of us it is our full-time job. Our names are Dr Oliver Hassall and Mr Johnstone Thitiri.

WHAT IS THE RESEARCH PROJECT YOU ARE DOING?

Some children who are admitted to hospital are so low in blood that they need to get blood from somebody else to help them get better. In the past this blood might have come from a friend or relative but now all blood is collected from people who volunteer to donate their blood to a stranger. In Coast Province, blood is collected from adult donors all over the Province by the Transfusion Centre in Mombasa and then given out to hospitals like Kilifi District Hospital.

Unfortunately, there is a shortage of blood for transfusion in Coast Province and other parts of Kenya. One result of this is that young children like yours who are low in blood and need a blood transfusion may not get blood when they need it. Some children may die as a result of this. In this research, we are looking at a new way of making the supply of blood better for these children.

After a baby is born in hospital the midwife clamps the umbilical cord and then cuts it before the baby can be given to the mother (See picture). A small amount of the baby's blood is left in the veins of the cord that is left behind and in the placenta (See picture). This is baby's blood, which is good blood that the baby does not need anymore, and it is normally thrown away with the rest of the after-birth. It is possible to collect this blood before it is thrown away and our project is looking at whether this blood could be used to give to young children like yours who need a blood transfusion.

We have asked mothers having their babies at Coast General Hospital in Mombasa if we can collect their baby's blood to give to another child who needs a blood transfusion. Many have agreed and have donated their baby's blood so that it can save another child's life. This blood has been tested for safety and stored in exactly the same way that all blood that is going to be transfused is tested and stored. This includes testing for HIV. The chance of infection from any blood transfusion is low in blood that has been tested and this chance is even lower in baby blood.

This study aims to find out if transfusions with the screened baby blood we have collected in Mombasa will be the same, better or less good than transfusions with blood collected in the usual way from adults. If your child is low in blood and the doctor thinks that he/she needs to have blood transfusion, we would like you to think about whether you would let your child receive the baby blood that has been donated.

WHAT WILL HAPPEN IF I TAKE PART IN THE STUDY?

1. Once it is known whether your child definitely needs a blood transfusion, we will check to see whether we have enough of the right kind of baby blood for your child. If we don't, then your child should be given the usual transfusion of adult blood and will not be able to participate in the study.

2. If we do have enough, your child will be given the baby blood over about 4 hours. S/he will stay on KEMRI ward during this time where we can use special equipment to watch the way the heart and blood are working.

3. Half way through the transfusion, we will take half a teaspoon of blood from your child's arm to make sure that your child has the right amount of important salts in his/her blood. This amount is safe and will not cause any harm to your child.

4. After the transfusion, your child can be moved back to Ward 1 from KEMRI ward. The day after the transfusion we will take another sample of half a teaspoon from your child's arm to make sure that the blood is now strong enough. This test is normal for all children who have had a transfusion.

5. After you have gone home with your child, we will ask you to bring your child back to the hospital for a check-up one month later. This will include another blood sample from your child's arm to see whether the blood is still strong.

6. If you are your child is unwell between leaving the hospital and coming back 1 month later, you can bring him/her back to KEMRI out-patients for examination and treatment at any time.

ARE THERE ANY DISADVANTAGES TO MY CHILD OR ME?

If you agree for your child to take part in this study, s/he will have half a teaspoon of blood removed from the arm half way through the transfusion and after one month. Taking blood samples causes a small amount of pain and may cause bruising where the needle enters the skin. These amounts of blood are very small in comparison to the amount of blood a child has and so are safe to take even in a child whose blood is not strong enough.

You will be asked to bring your child back to KEMRI out-patients after one month and this will take time. KEMRI will reimburse transport costs for this return visit.

There are no known disadvantages to giving children who need a blood transfusion baby blood instead of adult blood but baby blood has not been used like this very often before. The effect of the baby blood on the important salts in your child's blood is not certain, which is why we will test them and watch your child carefully.

ARE THERE ANY BENEFITS FOR MY CHILD OR ME?

This study will help us understand whether baby blood can be a new way of making the supply of blood better for children like yours. So the main benefit is to other children in the future in Kenya and in other countries in Africa.

Your child will be watched more closely by KEMRI nurses and doctors than is usual for a child having a transfusion. This includes using special equipment to watch how the heart and blood are working.

If your child is unwell at any time during the month after you go home from the hospital, you can bring them to KEMRI OPD for examination and treatment.

DO I HAVE TO TAKE PART?

It is your decision whether or not your child takes part in this research project. If you do not wish to take part, your child will still receive the standard treatment for low blood on the ward, which may include the transfusion of normal adult blood. You are free to change your mind about taking part at any time.

WILL I BE ASKED TO SIGN ANYTHING?

Yes. If you agree for your child to get a transfusion of baby blood and to take part in this research project, we will ask you to sign a form, which says that you have agreed to take part after being given the information and understood it. This is normal for all research projects.

WHAT DO I DO IF I HAVE ANY QUESTIONS OR CONCERNS?

A fieldworker will discuss all the issues with you before they invite you to take part in the project. You may ask questions then or at any stage. You may also contact Mr Johnstone Thitiri or Dr Oliver Hassall at any time. They may be found at KEMRI and their phone numbers are given below:

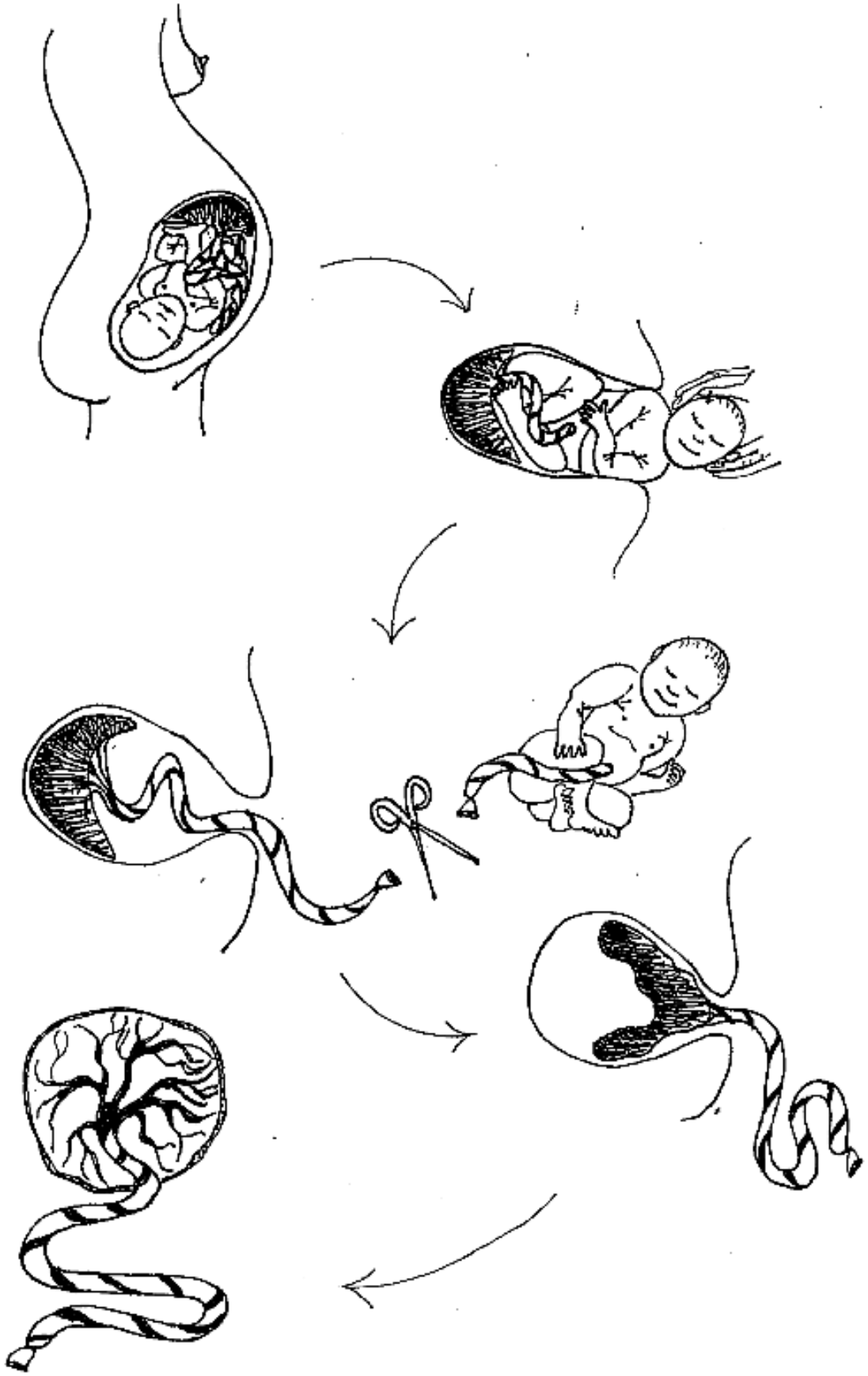
KEMRI	041 522063	Johnstone Thitiri	0722 408020
	0733 268290		
	0722 203417	Oliver Hassall	0723 495943

If you wish to speak to somebody not connected with the study, you may contact the KEMRI Community Liaison Officer, Ms Dorcas Kamuya through the KEMRI telephone numbers given above.

Ethical concerns about the study may be directed to:

Mr Ambrose Rachier
The Chairman
National Ethics Committee
PO Box 5840
NAIROBI

0722 205901
0733 400003



CONSENT AGREEMENT

I, _____ , confirm that I have been told about the study called:

The safety and efficacy of packed cord red blood cell transfusion for severe anaemia in children in a Kenyan hospital

which is being run by Dr. Oliver Hassall.

This study is looking at giving baby blood donated from umbilical cords instead of adult blood to children when they have low blood and need a transfusion.

_____ *(name of person taking consent)*

has explained to me in a way that I understand that if my child takes part in the study, s/he will:

- be closely observed on KEMRI ward during the transfusion
- have an extra blood test half way through the transfusion
- be asked to have a check-up and a blood test 1 month after leaving the hospital

I also understand that:

- my child does not have to take part in the study
- I can decide to take him/her out of the study at any time
- if my child does not take part in the study, it will not effect his/her medical care in any way

I have been allowed to ask questions concerning the study and I am happy with the answers. If I have any other questions, I may get in touch with:

Oliver Hassall, Wazo Geni team	522063, 0723 495943
Johnstone Thitiri, Wazo Geni team	522063, 0722 408020
Dorcas Kamuya, KEMRI	522063
Ambrose Rachier, NEC	0722 205901, 0733 400003

Yes, I wish for my child to participate in this study

Signature: _____ Date: ___ / ___ / ____

or thumb print of parent/guardian

Signature: _____ Date: ___ / ___ / _____

of person taking consent

Witnessed: _____ _____

Print name *Sign*

Date: ___ / ___ / _____

Usalama na ubora wa uongezaji damu ya kitovu kwa watoto wenye upungufu mkubwa wa damu katika hospitali moja, Kenya.

FOMU YA UJUMBE

SISI NI NANI?

Sisi twafanya kazi na shirika la utafiti la KEMRI (Kenya Medical Research Institute). KEMRI ni kitengo cha wizara ya afya na hufanya utafiti kutambua magonjwa na afya hapa Kenya ili kutafuta mbinu za kuboresha afya ya watu wa Kenya. '*Wazo Geni*' ndilo jina fupi la mradi wetu.

Mradi wa utafiti ambo tunafanya unashirikisha watu wengi hapa Kilifi District Hospital, lakini kwa wachache wetu, hii ndio kazi yetu ya kila wakati. Majina yetu ni Dr. Oliver Hassall na Johnstone Thitiri.

NI MRADI GANI WA UTAFITI TUNAOFANYA?

Watoto fulani ambo hulazwa hospitalini huwa na kiwango kidogo sana cha damu hadi wao kuhitaji damu kutoka kwa mtu mwingine kuwasaidia ili kupata nafuu. Hapo zamani, damu hii ingepatikana kutoka kwa rafiki, au jamaa, lakini siku hizi, damu yote hutolewa kutoka kwa watu amboa hujitolea kutoa damu yao kwa watu wasiowajua. Katika mkoa wa pwani, damu hutolewa kutoka kwa watu wazima wa kujitolea kote mkoani na shirika la Transfusion Centre kule Mombasa, na kisha kupewa mahospitali kama hii ya Kilifi District Hospital.

Kwa bahati mbaya kuna uhaba wa damu ya kuongezwa watu hapa katika mkoa wa pwani, na pia, katika sehemu nyingine za Kenya. Mojawapo ya matokeo ya hii ni kwamba, watoto wadogo kama huyu wako ambao wana upungufu wa damu, na ambao wanahitaji kuongezwa damu, huenda wakakosa damu wanapoihitaji.Watoto wengine waweza kufa kutokana na hii. Katika uchunguzi huu, tunaangalia mbinu mpya ya kuimasisha kuwepo kwa damu kwa watoto hawa.

Baada ya mtoto kuzaliwa hospitalini, mkunga hufunga kitovu cha mtoto, na kisha kukikata, kabla ya mtoto kupewa mamake (angalia picha). Kiwango kidogo cha damu ya mtoto hubaki katika mishipa ya kitovu na pia kwenye kondo la uzazi (angalia picha). Hii damu ni ya mtoto na ni nzuri lakini mtoto huwa haihitaji tena, na kawaida hutupwa pamoja na kondo la uzazi. Kuna uwezekano wa kuichukua damu hii kabla haijatupwa, na mradi wetu unachunguza kama damu hii inaweza kutumika kuwapa watoto wadogo kama huyu wako, ambao wanahitaji kuongezwa damu.

Tumeuliza wamama wanaojifungua katika hospitali kuu ya mkoa wa pwani, Mombasa kama tunaweza kuchukua damu ya watoto wao ili ipewe mtoto mwingine ambaye anahitaji kuongezwa damu. Wengi wamekubali na wametoa damu ya watoto wao ili iweze kuokoa maisha ya mtoto mwingine. Hii damu imepimwa usalama na kuhifadhiwa kwa njia sawa kabisa na vile damu yote ya kuongezwa watu hupimwa na kuhifadhiwa. Hii inahusisha kupima Virusi vya Ukimwi. Uwezekano wa kupata magonjwa kutokana na uongezaji damu wowote huwa ni wa chini kutoka kwa damu iliyopimwa, na huu uwezekano ni wa chini hata zaidi kwa damu ya mtoto.

Utafiti huu unanuia kubainisha kama uongezaji wa damu ya mtoto iliyopimwa, ambayo tumeitoa kule Mombasa itakuwa sawa, bora zaidi au ya chini kwa uzuri,
ikilinganishwa na uongezaji damu inayotolewa kwa kawaida kutoka kwa watu wazima. Kama mtoto wako ana damu kidogo na daktari afikirie kuwa yete anahitaji kupata damu, tungependa wewe ufikirie kama ungeweza kukubali mtoto wako apate damu ya mtoto ambayo imetolewa.

NI NINI KITAFANYKA NIKISHIRIKI KATIKA UTAFITI HUU?

1. Mara itakapojulikana kwa hakika kwamba mtoto wako anahitaji kuongezwa damu, tutachunguza kuona kama tuko na damu ya kotosha, na ambayo ni sawa kwa mwanao. Kama hatuna, basi mtoto wako ataongezwa damu ile ya kawaida ya kutoka kwa mtu mzima, na hataweza kushiriki katika utafiti huu.

2. Kama tuko na damu ya kutosha, mtoto wako atapewa damu ya mtoto kwa muda wa masaa manne. Yeye atakuwa katika ward ya KEMRI wakati huo, ambako tutaweza kutumia vifaa maalum kutazama vile moyo na damu yake inavyofanya kazi.

3. Katikati mwa kuongezwa damu, tutachukua kama nusu kijiko kidogo cha chai, ya damu, kutoka kwenye mkono wa mtoto wako ili kuhakikisha kuwa mtoto wako yuko na kiwango kizuri cha madini muhimu katika damu yake. Hiki kiwango cha damu ni salama na hakitadhuru mtoto wako.

4. Baada ya kuongezwa damu, mtoto wako anaweza kurudisha ward 1 kotoka ward ya KEMRI. Siku moja baadaye, baada ya kuongezwa damu, tutachukua damu nyingine ya nusu kijiko kutoka kwenye mkono wa mtoto wako ili kujua kama damu yake imeimarika. Hii ni kawaida kwa watoto wote amboa huongezwa damu.

5. Baada ya wewe kuenda nyumbani, na mtoto wako, tutakuuliza kumleta mtoto wako hospitalini tena kwa kuchunguzwa, mwezi mmoja baadaye. Hii itahusisha kotolewa kwa damu nyingine kutoka kwa mkono wa mtoto wako, ili kucunguza kama damu bado iko na nguvu (imeimarika)

6. Kama mtoto wako ni mgonjwa kati ya kutoka hospitalini na kurudi hospitalini mwezi mmoja baadaye, waweza kumrejesha mtoto katika KEMRI outpatient, ili achunguzwa na atibiwe, wakati wowote

JE KUNA MADHARA YOYOTE KWANGU AU MTOTO WANGU?

Ukikubali mtoto wako ashiriki katika uchunguzi huu, atatolewa kama nusu kijiko cha chai ya damu kutoka kwa mkono wake, katikati mwa kuongezwa damu, na baada ya mwezi mmoja. Kuchukua sampuli ya damu huleta kiasi kidogo cha uchungu na pia yaweza kusababisha maumivu pale sindano inapoingia kwenye ngozi. Viwango hivi vya damu ni vidogo sana ikilinganishwa na kiwango cha damu ambayo mtoto huwa nayo na kwa hivyo ni salama kutoa hata kwa mtoto ambaye damu yake ni ya chini.

Utaulizwa kumrejesha mtoto wako katika KEMRI outpatient baada ya mwezi mmoja na hii itachukua muda. KEMRI itakurejeshea nauli yako kwa kukuja huku.

Hakuna madhara zozote zinazojulikana za kuwapa watoto amboa wanahitaji kuongezewa damu, damu ya mtoto badala ya ile ya watu wazima, lakini damu ya mtoto haijatumika kwa njia hii, kitambo, kwa mara nyingi.Matokeo ya damu ya mtoto kwa madini muhimu katika damu ya mtoto wako haijulikani na ndio sababu tutayapima na kumtazama mtoto wako kimakini.

JE KUNA MANUFAA YEYOTE KWA MTOTO WANGU AU MIMI?

Utafiti huu utatusaidia kuelewa kama damu ya mtoto yaweza kuwa njia mpya ya kuimarisha upatikanaji wa damu kwa watoto kama wako. Kwa hivyo, manufaa makubwa ni kwa watoto wengine katika siku za usoni Kenya na nchi zingine Africa.

Mtoto wako atachungwa kwa makini zaidi na wauguzi wa KEMRI na madaktari kuliko ilivyo kawaida kwa mtoto anayeongezwa damu. Hii itahusisha kutumia vifaa maalum kutazama vile moyo na damu zinavyofanya kazi.

Kama mtoto wako atakuwa mgonjwa kwa wakati wowote katika mwezi baada ya kwenda nyumbani, unaweza kumleta katita KEMRI OPD, kuchunguzwa na kutibiwa

NI LAZIMA KWANGU KUSHIRIKI?

Ni uamuzi wako kama mtoto wako atashiriki katika mradi huu wa utafiti au la. Kama haupendelei , mtoto wako atapata matibabu ya kawaida kwa kuwa na damu ya chini hapa kwa wodi, ambayo yaweza hususha kongezwa damu ya kawaida ya mtu mzima. Uko huru kubadilisha nia ya kushiriki katika wakati wowote.

NITAULIZWA KUWEKA SAHIHI?

Ndio. Ukikubali mtoto wako apate kuongezwa damu ya mtoto na kushiriki katika mradi huu wa utafiti, tutakuuliza kuweka sahihi fomu ambayo inasema kwamba umekubali kushiriki baada ya kupewa maelezo na kuelewa. Hii ni kawaida kwa miradi yeyote ya utafiti.

UFANYE NINI UKIWA NA MASWALI YEYOTE AU TASHWISHI?

Mmoja wa washirki wa mradi huu atajadili na wewe mambo yote na kukualika kushiriki katika huu mradi. Unaweza kuuliza maswali wakati huo au kwa wakati wowote. Unaweza pia wasiliana na Johnstone Thitiri au Dr. Oliver Hassall kwa wakati wowote.
Wanaweza patikana kwa KEMRI na nambari zao za simu ni;

KEMRI	041 522063 0733 268290	Johnstone Thitiri	0722 408020
	0722 203417	Oliver Hassall	0723 495943

Kama ungependa kuzungumza na mtu asiyehusika na huu uchunguzi, waweza kuwasiliana na (KEMRI Community Liaison Officer) Ms Dorcas Kamuya ukitumia nambari za KEMRI ulizopewa hapo juu.

Mashaka yoyote ya maadili kuhusu utafiti huu waweza kuelekezwa kwa:

Mr. Ambrose Rachier
Mwenyekiti
Tume ya Taifa ya Maadili
P.O BOX 5840
Nairobi

0722 205901
0733 400003

IDHINI YA MAKUBALIANO

Mimi, _____, nadhibitisha kwamba nimeelezwa kuhusu uchunguzi uitwao:

Usalama na ubora wa uongezaji damu ya kitovu kwa watoto wenye upungufu mkubwa wa damu katika hospitali moja, Kenya.

ambao unaendeshwa na Dr. Oliver Hassall.

Utafiti huu unachunguza kutumia damu ya mtoto iliyotolewa kutoka kwa kitovu badala ya damu ya watu wazima,kwa watoto wanapokuwa na upungufu wa damu na kuhitaji kuongezwa.

_____ (*jina la anayetafuta idhini*)

amenielezea kwa njia ambayo nimeelewa kwamba,ikiwa mtoto wangu atashiriki katika utafiti huu,yeye:

- Atachunguzwa kwa makini katika wodi ya KEMRI wakati wa kuongezwa damu.
- Atapata kipimo cha damu cha ziada katikati mwa kuongezwa damu
- Ataulizwa kuonekana na pia kupata kipimo cha damu kingine mwezi mmoja baada ya kutoka hospitali

Mimi pia ninaelewa kwamba:

- Sio lazima mtoto wangu kushiriki
- Ninaweza kuamua kumtoa yeye katika huu mradi wakati wowote
- Ikiwa mtoto wangu hatashiriki katika mradi huu,hii haitadhuru matibabu yake kwa njia yeyote.

Nimekubaliwa kuuliza maswali kuhusu huu uchunguzi na nimeridhika na majibu yake. Kama niko na maswali mengine,ninaweza kuwasiliana na :

Oliver Hassall, timu ya Wazo Geni	522063, 0723 495943
Johnstone Thitiri, timu ya Wazo Geni	522063, 0722 408020
Dorcas Kamuya, KEMRI	522063
Ambrose Rachier, NEC	0722 205901, 0733 400003

Ndiyo, nimekubali kuwa mtoto wangu ashiriki katika mradi huu.

Sahihi: _____ Tarehe: ___ / ___ / _____

au alama ya kidole ya mzazi au mlezi

Sahihi: _____ Tarehe: ___ / ___ / _____

ya anayechukua idhini

Shahidi: _____ _____

Andika jina *Sahihi*

Tarehe: ___ / ___ / _____