cord blood: collection of umbilical cord blood for haematology examination

1. Purpose
This document provides details of the Cord blood: collection of umbilical cord blood for haematology examination procedure at the Women's.

2. Definitions
- Cord blood: fetal blood obtained directly from the umbilical cord at or shortly after birth
- Maternal blood: venous blood collected from the mother within 72 hours of the birth of the placenta
- EDTA: an anticoagulant used in the collection of medical and laboratory specimens
- Group: blood group
- DAT: Direct Antiglobulin Test: a blood test used to detect maternal red cell antibodies on fetal red cells which may cause haemolysis e.g. in Rhesus disease.
- HDN: haemolytic disease of the newborn
- FMH test: fetomaternial haemorrhage test to determine the amount of fetal cells present in the maternal circulation.

3. Key responsibilities of key staff
- Midwives who attend and supervise births
- Perioperative nurses attending operative births
- Medical staff attending births
- Midwifery and medical students under supervision.

4. Procedure
4.1 Equipment
- 20mL syringe with plunger removed OR Multi adapter and needle
- 9mL red top EDTA tube
- Pathology Request form.

4.2 Criteria for cord blood collection
4.2.1 Test required: Blood group and DAT
- Mother is Rh D negative (NOTE: refer below to section: 4.3 Criteria for maternal blood collection)
- Mother has red cell antibody detected in pregnancy (check 26 week test result as per CPG: Red Cell Antibody Testing In Pregnancy)
- Mother has past history of infant with HDN or significant neonatal jaundice
- Preterm delivery <37 weeks
- Obstetrician or paediatrician request.

4.3 Criteria for maternal blood collection
- Rh negative women require maternal blood to be taken within 72 hours of the birth of the placenta and sent for testing for FMH.
- This is the responsibility of the midwife attending the birth and the midwife caring for the woman in the postnatal period.
- Refer to CPG: Rh D Immunoglobulin in Obstetrics.

4.4 Process: Cord blood collection after vaginal birth
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- The attending midwife identifies and records in CIS: Perinatal Flowsheet the indication for cord blood collection on admission to Birth Centre.
- Cord blood is collected before birth of the placenta where practicable by the accoucheur, assisted by the second midwife.
- The cord is double clamped and in order to reduce contamination by Wharton's jelly or maternal blood, the severed end of the cord is wiped with a dry x-ray detectable gauze swab (e.g. Suturex).
- To reduce the risk of contamination of the EDTA tube by blood spillage, the severed end of the cord is placed into the barrel of the 20mL syringe.
- The clamp is released and blood is funneled directly from the cord, through the 'funnel' to the EDTA tube held by the second midwife.
- To prevent clotting of the sample, the tube is gently agitated to mix the anticoagulant with the blood.
- To reduce the risk of needle-stick injury, direct aspiration by needle and syringe is used only when the 'funnel' method is not practicable. In this situation, blood is directly aspirated from the cord to the EDTA tube using a multi-adapter.

4.5 Process: Cord blood collection at caesarean birth
- The midwife attending the woman identifies that cord blood collection is required and documents this on the theatre checklist (MR 44034) under 'other relevant patient information'.
  - The indication for cord blood collection is also recorded on the theatre checklist.
  - The midwife verbally informs the holding bay nurse/receiving nurse of the requirement for cord blood group and DAT and cord blood gas when the patient enters the Operating Suite.
  - In the Theatre, the midwife verbally informs the instrument and circulating nurse that cord blood group and DAT and cord blood gas specimens are required.
  - The instrument nurse advises the surgeon that cord blood specimens are required. The cord is to be clamped in 2 sections (4 clamps in all) to allow both cord blood group and DAT and cord blood gas specimen collection.
  - The circulating nurse/midwife collects the cord blood group and DAT specimen, by using a 9mL EDTA tube with a multi-Adapter and 21G needle attached, from one clamped section of the cord as soon as it is received from the instrument nurse to prevent clotting of the sample, the tube is gently agitated to mix the anticoagulant with the blood.
  - The circulating nurse/midwife collects the cord blood gas specimens if obstetrician is unavailable to do so.
    - This is performed using two pre-heparinised syringes and two 21G (green) needles.
    - The cord blood gas specimens are obtained from the other clamped section of the cord.
    - The arterial specimen is taken from the single larger blood vessel in the umbilical cord, and the venous specimen from the single larger blood vessel in the umbilical cord.
    - The specimens must be clearly labelled as arterial and venous cord blood. The cord blood specimens must be sent to the core laboratory as soon as possible and placed on ice.

4.6 Labelling of cord blood specimens
The specimen is labelled according to the procedure: Specimen Labelling and Signing.
Baby UR numbers are used for all baby specimens. If the baby is not registered on IPM the prompts on the initial baby labels must be completed for the specimen to be accepted in pathology.
- The baby label is attached to the EDTA tube and must contain the following:
  - 'Baby of' mother's family name and given name
  - date of birth
  - gender
  - date and time of collection
  - add the words 'cord blood' if the specimen is a cord blood specimen
  - multiple births: mark specimen tube label and pathology request slip label accordingly: e.g. "twin 1 of (mother's name), "twin 2 of (mother's name), "triplet 1 of (mother's name)"
- The specimen label must be initialled by the person taking the specimen and the declaration on the pathology slip must be signed by the same person.
- A pathology request form is completed and sent with the specimen to the laboratory for grouping and DAT (formerly Coombs) as per CPG: Rh D Immunoglobulin in Obstetrics.

Note: Handwritten baby identification labels should have a thin red line drawn through the blank portion to reduce the risk of confusing mother and baby ID labels.

5. Performance indicators
1. All women who meet the criteria have cord blood taken for haematological examination.

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2. Cord blood for haematological examination is appropriately labeled and of a suitable quality for testing.

6. References

Policy and Procedure Manual
- Specimen Labelling and Signing

Clinical Practice Guidelines
- Red Cell Antibody Testing in Pregnancy
- Rh D Immunoglobulin in Obstetrics

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