

STEP 1 - COLLECTION BAG PREPARATION

1. Open outer bag and retain Chloro Prep applicators.
2. Open internal bag using aseptic technique.
3. All clamps on collection bag are open - **Blue Clamps #1 & #2** and **Red Clamp #3** (Fig. 1)

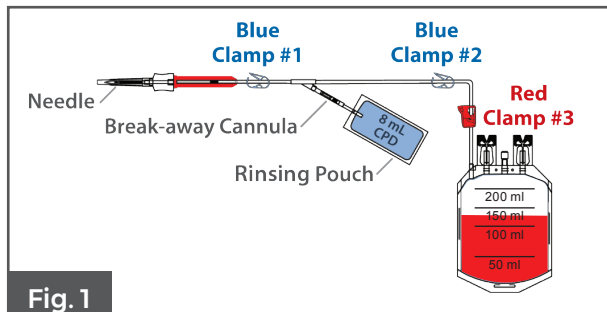


Fig. 1

CAUTION
DO NOT CLOSE **Red Clamp #3** as once closed, cannot be reopened.

STEP 2 - CORD BLOOD COLLECTION

1. Double clamp the umbilical cord and cut between clamps.
2. Prepare needle insertion site by disinfecting umbilical cord, just above clamp, using Chloro Prep applicator.
3. Remove needle cap then insert needle at prepared insertion site.
4. Once blood flows, lower collection bag and wait until blood flow stops. Invert bag to mix blood.
5. At end of collection, close **Blue Clamp #1** and engage needle guard.

STEP 3 - POST COLLECTION

1. Snap break away cannula on top of rinsing pouch. (Fig. 2)
2. Drain contents of rinsing pouch into tubing to flush remaining blood (~8 mL) into collection bag.*

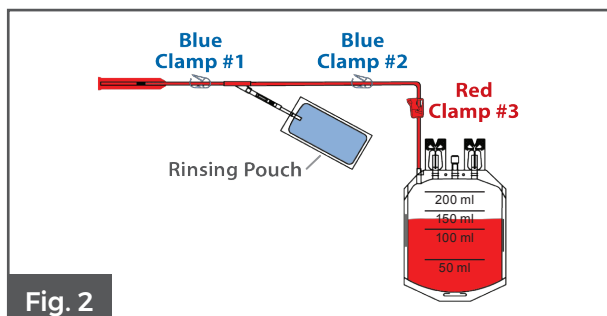


Fig. 2

***IMPORTANT STEP**
Increases volume of cord blood collected.

3. Ensure **Blue Clamp #2** is near rinsing pouch, then close clamp.
4. To strip contents of tubing, slide closed **Blue Clamp #2** next to **Red Clamp #3**.
5. **Close Red Clamp #3.**
6. Complete and apply Collection Label as per instructions on pages 6 & 7 in this booklet.
7. Place Cord Blood Unit into specimen bag and package per Parent's booklet.

An individual cord blood collection kit is required for each newborn. In the event of a multiple delivery, individual uniquely labelled kits will be provided.

Each kit contains:

- Blood collection bag containing anticoagulant/nutrient. Bag is sealed in an outer pouch with an inner sterile plastic pouch
- One-step Chloro Prep applicators
- Cord blood identification labels
- Packaging material

There are two main techniques for collection of cord blood from the umbilical vein: before placenta is delivered (in utero) or after (ex utero). Techniques described below are consistent with those recommended by the Society of Obstetricians and Gynaecologists of Canada (SOGC)¹. The safety and well-being of mother and infant shall take precedence over the cord blood collection. Avoid manipulation and milking of the cord as it minimizes the volume of the sample. Maximal cord blood volume will improve stem cell recovery.

The healthcare professional performing the collection of the cord blood agrees to collect the cord blood and understands that the collection is being done at the request of the patient. Training for the collection of cord blood is detailed below. The collector must read the training materials prior to commencing the collection and feel competent to perform the collection by signing the Cord Blood/Cord Tissue Collector Agreement in the Parent's Instructions booklet.

- NOTE:**
1. If the cord blood collection is performed in utero in a multiple gestation pregnancy, all infants should be delivered before any cord blood collection begins.
 2. If unit is collected in utero at less than 34 weeks' gestation, collection should be based on an evaluation of infant donor safety by the licensed healthcare professional responsible for the delivery.

VAGINAL DELIVERY (IN UTERO COLLECTION)

1. Open outer collection bag and retain Chloro Prep applicator. Using sterile technique, place inner pouch and Chloro Prep applicator on delivery room table.
2. Open internal bag and Chloro Prep applicator using aseptic technique and ensure all clamps on collection bag are open - **Blue Clamps #1 & #2** and **Red Clamp #3. (Fig. 1)**
3. Within first 1 minute after birth, double clamp the cord 3 to 5 cm above umbilicus and cut between clamps (according to SOGC guidelines).
4. On the side of the umbilical cord, select a needle insertion site above clamp and thoroughly disinfect using Chloro Prep applicator.
5. Remove needle cap then insert needle at prepared insertion site.
6. Holding needle in place, lower bag as contractions and gravity will assist collection. Placing baby on maternal abdomen has been reported to improve recovery volume.¹

NOTE: If side of umbilical vein wall is punctured, if clot develops or if cord collapses, clamp cord above existing needle site and attempt to locate a new puncture site, closer towards placenta. Disinfect site and reinsert needle.

7. To avoid clotting in blood bag, mix frequently during collection, which may take 5 - 10 minutes. If blood flow from cord stops, wait 5 seconds; vein may re-engage and flow may restart.
8. Once blood flows, lower collection bag and wait until blood flow stops. Invert bag to mix blood.
9. Total time required for in utero cord blood collection is less than 10 minutes.² Continue collection until blood ceases to flow.

AFTER PLACENTA DELIVERY (EX UTERO COLLECTION)

1. If placenta is delivered prior to completion of the in utero collection, try to avoid re-clamping the cord.
2. Remove placenta by traction with 4 x 4s into a sterile basin. Placenta may sit in a basin after separation for up to 20 minutes and still yield a suitable sample.
3. Place placenta, fetal side up, maternal side down, with the cord dangling over the basin edge. Ensure needle is inserted in the umbilical vein and allow drainage by gravity into blood bag. **Continue collection until blood from cord ceases to flow.** This method will take longer than with an attached placenta (average 20 minutes).

CAESARIAN DELIVERY

1. Collect the cord blood using the same method as described for vaginal birth.
2. Ring forceps at the angles of the uterine incision may help to prevent maternal blood loss during collection.

PREPARATION OF CORD BLOOD - POST COLLECTION

1. At end of collection, remove needle from umbilical vein and to maximize collection, hold tubing up to allow blood to drain into bag.
2. Close **Blue Clamp #1** and engage needle guard by pulling on tubing to slide needle into needle guard.
3. Snap break away cannula on top of rinsing pouch. **(Fig. 2)**
4. Drain contents of rinsing pouch into tubing to flush remaining blood (~8 mL) into collection bag.
5. Ensure **Blue Clamp #2** is near rinsing pouch, then close clamp
6. To strip contents of tubing, slide closed **Blue Clamp #2** next to **Red Clamp #3** and close **Red Clamp #3**.
NOTE: Closing **Red Clamp #3** is critical to protect the cord blood from leaking if the blue clamp releases.
7. Gently invert the bag several times to mix anticoagulant with the blood.
NOTE: Client has been instructed that delivery staff cannot provide a measurement of the cord blood. Only Inception Lifebank can give an accurate measurement of the cord blood.
8. Complete and apply Collection Label as per instructions on pages 6 & 7 of this booklet.
9. Place labelled Cord Blood Unit into specimen bag and package according to pictorial in parent's booklet.

References

1. B. Anthony Armson, Daniel S. Allan, Robert F. Casper, Umbilical Cord Blood: Counselling, Collection and Banking, Journal of Obstetric Gynecology Can 2015; 37 (9) : 832-844.
2. Grisaru D, Deutsch V, et al. Placing the newborn on the maternal abdomen after delivery increases the volume and CD34+ cell content in the umbilical cord blood collected: an old maneuver with new applications. Am j Obstet Gynecol. 1999;180:1249-1243.