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Cord Blood Program

Cord blood is collected from the umbilical cord after the birth and the separation of the baby from the umbilical cord. Cord blood may be collected either prior to the delivery of the placenta, or while the placenta is still attached to the uterus or after the placenta has detached to the uterine wall; more importantly, safety of mother, baby and health care provider is of first consideration. Collection of the blood remaining in the umbilical cord, veins and placental tissue can only take place at the time of delivery.

Immediately after the birth of the baby, the umbilical cord is cut and the baby separated from the placenta and mother. The placenta is delivered a few minutes later. The portion of the umbilical cord still attached to the placenta is clamped and cleaned. A sterile shielded needle is inserted into the umbilical vein and the placental blood is passively drawn into a sterile blood collection bag containing anticoagulant.

Blood can also be drawn from the cord while the placenta is still attached to the uterus using the same procedure. In this case, the placental blood yield may be greater because the placenta continues to pulsate during the collection process facilitating blood flow.

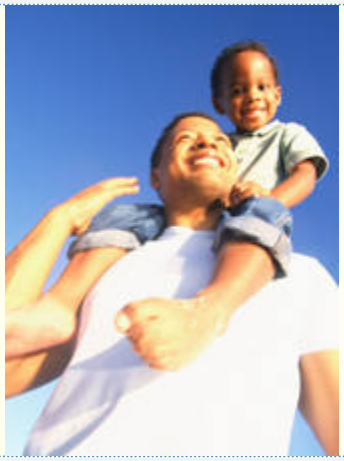
The collection process is non-invasive and completely painless. It does not present any risks to either mother or baby, since the blood is collected from the cord once it is cut.

Typically 60-150 mls of cord blood can be collected. A minimum volume of 40 mls is preferred before processing can take place, in order to ensure a sufficient quantity of stem cells in the final frozen product. However, there is great potential in stem cell research and the future may offer the possibility to grow cord blood stem cells in the laboratory to increase their numbers, and hence less than 40 mls may be acceptable.

Once the collected cord blood and the maternal blood sample are placed back in the cord blood collection kit, you or your partner must contact HemaStem's 24 Hour Clinical Help Line to advise that there is a sample awaiting collection. HemaStem will arrange and coordinate the pickup. Your baby's cord blood sample will then be shipped to our processing laboratory for processing, pathology testing and freezing at the cryogenic temperature required for the long-term storage of the cord blood.

Processing of the Cord Blood Sample
On arrival at our facility, the volume of your baby's cord blood sample is carefully measured and the sample is then processed to remove the red blood cells and excess plasma components and to isolate the component that contains cord blood stem cells.

When processing is complete, the cord blood is frozen in specially designed multicompartment freezing bags - developed to withstand cryogenic conditions without damage. During freezing, formation of large ice crystals inside of cells can cause irreversible damage. However, the use of a special chemical solution in combination with the precise control



of the rate of freezing, reduces these effects and therefore protects the cells.
Following the controlled rate freezing of the cord blood, the cells are stored in liquid nitrogen. Finally, tests for sterility, viability and cell counts are performed.

Collection and Processing of the Maternal Blood Sample
A maternal blood sample is taken at the same time as your child's cord blood sample is collected, and sent to HemaStem in the same kit as the cord blood. When HemaStem receives the maternal blood sample, it is tested for Hepatitis B and C, HIV, HTLV, Syphilis and West Nile virus.

Often, some of these tests may have been done during pregnancy, but we are obliged to repeat them. If any of these tests is positive, HemaStem may not be able to store the child's cord blood.

You need to be aware that the testing for these infectious conditions is an essential part of the cord blood collection and storage process. If you have any concerns about undergoing this testing, we would be happy to discuss it further with you to help you decide whether you wish to proceed.

Bacteriology & Fungal tests are performed on each cord blood unit. These tests are performed to provide the transplant team with the information they will need to determine if antibiotics would be needed during a transplant. Cell count and cell viability tests are also conducted both before and after the processing of the unit.
Regulating agencies require eight tests to be performed on the mother's blood and the cord blood. HemaStem's' lab performs all of the following tests on maternal blood samples and we also include as part of our standard operating procedure the testing for the debilitating West Nile Virus:

ABO/Rh - used to determine the blood type of the donor.
RPR - qualitative screening test for the detection of syphilis.
Antibody Screen - used in the detection of unexpected antibodies to red cells in order to prepare or select donor units for transfusion.
HIV-1/2(Human Immunodeficiency Virus Types 1 and 2) - - used to detect antibodies to HIV-1 and/or HIV-2 and to identify potentially infectious units of donated blood and plasma.
HTLV-I/II (Human T-Lymphotropic Virus Types I & II) - - used as a screen for donated blood to prevent transmission of HTLV-I and HTLV-II to recipients of blood components.
HbsAg (Hepatitis B Surface Antigen) - - used as a qualitative and/or semi-quantitative test of total antibody to Hepatitis B Surface Antigen as an aid in the diagnosis of Acute Hepatitis B.
NAT (Nucleic Acid Test) - used for screening blood donors at unknown risk for HIV-1 infection.
HBC (Hepatitis B core Antibody) -used for the detection of total antibody to Hepatitis B virus core antigen, screening of blood and blood products intended for transfusion and as an aid in the diagnosis of ongoing or previous Hepatitis B virus infection.
HCV (Hepatitis C Virus) - used to detect antibody to Hepatitis C Virus
CMV (Cytomegalovirus) Total Antibody - used as a screen for the presence of antibody to CMV in blood or plasma donors.
NAT-HCV & NAT HIV - - Nucleic Acid Testing (NAT) utilizes highly specific probes to detect the DNA (deoxyribonucleic acid) and/or RNA (ribonucleic acid) of the Hepatitis C virus and the Human Immunodeficiency Virus
West Nile Virus Testing - conducted on the the maternal mothers sample
Confirmatory Tests performed:
HIV-1 NAT Neutralization Test





HbsAg Confirmatory Test (Neutralization)

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