AsiaCORD

International Standards for Cord Blood Collection, Processing, Testing, Banking, Selection and Release

First Edition November, 2001

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Introduction

These Standards based on NETCORD/ FACHT standards (2nd version) were adopted by consensus by representatives of AsiaCORD. They were adopted by the Boards of AsiaCORD after a period of public comment. They were revised November 1, 2001 and are effective June, 2002. AsiaCORD is responsible for the acts or omissions of the other.

Notice

These Standards are designed to provide minimum guidelines for facilities and individuals performing cord blood collection, processing, testing, banking, selection and release or providing support service for such procedures. These Standards are not intended to include all procedures and practices that a Cord Blood Bank or individual should implement if the standard of practice in the community or federal or state laws or regulations establish additional requirements. Each Cord Blood Bank and individual should analyze its practices and procedures to determine whether additional standards apply. AsiaCORD disclaim any responsibility for setting maximum standards and expressly do not represent or warrant that compliance with these Standards is an exclusive means of complying with the standard of care in the industry or community.

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Part A: TERMINOLOGY, ABBREVIATIONS AND DEFINITIONS

A1.000 Terminology

For purposes of these Standards, the terms *shall*, *will*, or *must* mean that the Standard is to be complied with at all times. The terms *may* and *should* indicate an activity that is recommended or advised, but for which there may be effective alternatives.

A2.000 Abbreviations

The following abbreviations and definitions are used these Cord Blood Standards;

ABO	Major human blood group system.
Ag	Antigen.
Anti-	An antibody to the antigen designated.
ASHI	American Society for Histcompatibility and Immunogenetics.
°C	degree centigrade.
CB	Cord Blood
CBB	Cord Blood Bank
CMV	Cytomegalovirus
DNA	Deoxyribonucleic acid
EBV	Epstein-Barr virus.
FAHCT	Foundation for the Accreditation of Hematopoietic Cell Therapy.
GVHD	Graft-vs-host disease.
HLA	Human Leukocyte Antigen, the major histocompatibility system in humans.
HBc	Hepatitis B core antigen.
HBsAg	Hepatitis B surface antigen.
HBV	Hepatitis B virus.
HCV	Hepatitis C virus
HIV	Human immunodeficiency virus.
HTLV	Human T cell lymphotropic virus.
QM	Quality Management.
Rh	Rhesus system of human red blood cell types.

A3.000 Definitions

Adventitious refers to extraneous microbiological, chemical, or radiobiological agents introduced into the CB unit during collection, processing, or infusion.

Allogeneic refers to CB cells obtained from one donor and intended for infusion into another individual.

> *Unrelated allogeneic* refers to CB cells collected and stored for use by biologically unrelated individuals.
>
> *Related allogeneic* refers to CB cells collected and stored for use by an identified individual or family that is biologically linked to the cord blood donor.

Autologous refers to CB cells obtained from a donor and intended for infusion into that same individual.

CD34 refers to the 115kD glycoprotein antigen, expressed by 1-2% of normal bone marrow mononuclear cells, that is defined by a specific monoclonal antibody (anti-CD34) using the standardized cluster of differentiation (CD) terminology. The vast majority of CB progenitors, including those cells that give rise to hematopoietic colonies *in vitro*, are contained in the population of cells expressing the CD34 antigen.

CFU refers to colony forming unit, a clonogeneic cell able to produce colonies *in vitro* under specific conditions in the presence of appropriate colony stimulating factors and defined by the type of mature progeny that develop.

Collection Facility refers to the site where the infant is delivered and the CB units is collected.

Component refers to CB that is being processed, at any stage of the processing.

Computer system is the hardware, software, peripheral devices, personnel and documentation involved in production of an electronic record.

Contiguous segments are sealed lengths of tubing integrally attached to the CB unit that contain cord blood used for testing.

Cord Blood refers to the whole blood including hematopoietic progenitor cells collected from placental and umbilical cord blood vessels after the umbilical cord has been clamped.

Cord Blood Bank consists of an integrated program under a single Director responsible for the collection, processing, testing, banking, selection and release of CB for clinical use.

Cord Blood Collection is the procurement of CB for banking and transplantation before and/or after the placenta is delivered.

> *Ex utero* refers to collection of CB cells from the placental umbilical vessels after the placenta has been delivered.
>
> *In utero* refers to CB cells that are collected from the placental umbilical vessels after the infant has been delivered and separated from the umbilical cord, but before the placenta has been delivered.

Cord Blood cryopreserved is CB that has been frozen using devices, supplies, and techniques validated for that purpose.

Cord Blood Standards refers to this document, "International Standards for Cord Blood Collection, Processing, Testing, Banking, Selection and Release."

Cord Blood Unit is the nucleated cells including stem and hematopoietic progenitor cells harvested from placental and umbilical cord blood vessels from a single placenta after the umbilical cord has been clamped. Unless otherwise specified, the term CB unit in this document refers to all CB units regardless of method of collection or intended use.

> *Cord Blood Unit Unrelated Allogeneic* refers to a CB unit obtained from one donor and intended for infusion into another individual who is not

biologically related to the donor.

Cord Blood Unit Related Allogeneic refers to a CB unit that is intended for infusion into another individual who is biologically related to the donor.

Cord Blood Unit Autologous refers to a CB unit that is obtained from a donor and intended for infusion into that same individual.

Depletion is the manipulation of CB that results in the loss of specific targeted cell population(s) using validated techniques.

Director-For purposes of these Standards there are three categories of Director:

CBB Director is an individual with an earned doctoral degree in medicine, or in a related scientific field, with postdoctoral training in immunogenetics of transplantation, basic or clinical immunology, immunohematology, blood or tissue banking, or cryobiology. The CBB Director has final responsibility for the CBB scientific and clinical performance and its overall compliance with these Standards. The CBB Director should participate regularly in educational activities related to the field of hematopoietic progenitor cell collection, processing, transplantation and/or CB banking.

CBB Medical Director is a licensed physician with postdoctoral training in hematopoietic cell transplantation or blood and tissue banking. This individual is directly responsible for the medical aspects of the collection procedures and compliance of the collection facilities with these Standards. Where there are remote collection facilities shipping CB cells to a central laboratory, the CBB Medical Director, and need not be licensed in the jurisdiction of the collection or be on the staff of the collection facility. The CBB Medical Director may also serve as the CBB Director and/or CBB Laboratory Director should if appropriately credentialed. The CBB Medical Director should participate regularly in educational activities related to the field of hematopoietic progenitor cell

collection, processing, transplantation and/or CB banking.

CBB Laboratory Director is an individual with a relevant doctoral degree, qualified by postdoctoral training or experience for the scope of activities carried out in the CB processing facility. The CBB Laboratory Director is responsible for all procedures and administrative operations of the processing facility, including compliance with these Standards. The CBB Laboratory Director may also serve as the CBB Director and/or CBB Medical Director if appropriately credentialed. The CBB Laboratory Director should participate regularly in educational activities related to the field of hematopoietic progenitor cell collection, processing, transplantation and/or CB banking.

Donor is the infant from whose placenta the CB is obtained.

Directed donor refers to an infant whose CB is collected and stored for use by an identified individual or family. Directed donors could be related allogeneic or autologous donors.

Electronic record is any record or document consisting of any combination of text or graphics or other data that is crested, stored, modified, or transmitted in digital form by a computer.

Engraftment is the reconstitution of recipient hematopoiesis with white blood cells, red blood cells and platelets from the donor.

Expansion refers to growth of one or more populations of CB cells in vitro in a culture system.

FAHCT Standards refers to the current North American edition of Standards *for Hematopoietic Progenitor Cell Collection, Processing & Transplantation* published by FAHCT.

Gene Manipulation refers to the insertion of nucleic acid constructs into one or more populations of CB cells for the purpose of altering the genetic structure or function transiently or permanently.

Hematopoietic Progenitor Cells include primitive pluripotent hematopoietic cells in the CB capable of self-renewal as well as maturation into any of the hematopoietic lineages, including committed and lineage-restricted progenitor cells, unless otherwise specified, regardless of tissue source.

Institutional Review Board refers to a Board established by an institution in accordance with the regulations of the United States Department of Health and Human Services or other governmental agency if applicable, to review biomedical and behavioral research involving human subjects conducted at or supported by that institution.

Labeling includes steps taken to identify the original hematopoietic progenitor cell collection, any components, and any component modification; to complete the required reviews; and to attach the appropriate labels.

Linkage is the basic demographic information including name, that would allow identification of the CB donor and/or mother.

Manipulation refers to an ex vivo procedure(s) that selectively removes, enriches, expands or functionally alters hematopoietic progenitor cells.

Minimally Manipulated for the purposes of these Standards refers to the removal of red cells and/or volume reduction of a CB unit.

Microbial refers to infectious agents including bacterial and fungal organisms.

Mother. Any of the following:

Biological mother.	The woman from whose egg the infant donor develops; the egg donor.
Birth mother.	The woman who carries the infant to its delivery; may be the biologic mother or a surrogate mother.
Surrogate mother.	A woman who carries an infant from an egg(ovum) not biologically hers. Under circumstances of a surrogate mother carrying the infant to term and the CB unit being collected, both the surrogate and the

biologic mother shall be considered for purposes of infectious disease screening and testing; the biologic mother shall be considered for purposes of genetic information.

When used unmodified, the term mother is intended to include all of the above individuals.

AsiaCORD is the international organization of CB banks that meet defined membership requirements of AsiaCORD.

Nonconforming Unit is any CB unit that does not completely meet the requirements specified by these Standards.

Positive selection is the manipulation of CB such that a specific cell population(s) is enriched.

Processing includes all aspects of manipulation, cryopreservation and labeling of the CB.

Proficiency Test measures laboratories' abilities to analyze specimens of unknown values and obtain accurate results within acceptable ranges.

Quality refers to conformance of a product or process to pre-established specifications or standards.

Quality Assurance describes the actions, planned and performed, to provide confidence that all systems and elements that influence the quality of the product are working as expected individually and collectively.

Quality Assessment describes the actions, planned and performed, to evaluate all systems and elements that influence the quality of the product or service.

Quality Control refers to a component of a quality program that includes the activities and controls used to determine the accuracy and reliability of the establishment's personnel, equipment, reagents, and operations in the

manufacturing of hematopoietic progenitor cell components, including testing and product release.

Quality Improvement describes the actions planned and performed to develop a system to review and improve the quality of a product or process.

Quality Management refers to an integrated program of quality assessment, assurance, control and improvement.

Quality Management Supervisor is a qualified individual designated by the CBB Director, to establish methods to review, modify, approve and implement all procedures intended to maintain quality in the operation of the CBB, and to monitor compliance with these CB Standards.

Quarantine storage is storage of CB in a physically separate area clearly identified for such use, or using other procedures, such as automated designation to prevent improper release before infectious disease testing results are reviewed.

Reference samples are aliquots of cells, plasma, serum, or cellular material from the CB unit or blood from the mother that are used to confirm the identity, HLA typing, or genetic or transmissible disease information associated with a single CB unit. Such samples may or may not be contiguous segments.

Rh the abbreviation for the Rhesus system of human red cell antigens, is used in this document to refer to the Rh(D) antigen only unless otherwise specified.

Safety refers to relative freedom from harmful effects to persons affected, directly or indirectly, by a product when prudently administered, taking into consideration the character or the product in relation to the condition of the recipient at the time.

Selection refers to the dynamic process of identification of a CB unit for transplantation that meets recipient-defined criteria.

Standard Operating Procedures Manual refers to a complication of written detailed instructions required to perform procedures.

Transplantation refers to the infusion of allogeneic or autologous CB progenitor cells with the intent of providing transient or autologous CB progenitor cells with the intent of providing transient or permanent engraftment.

Volume reduction is the manipulation of the CB unit that results in loss of CB volume without significant loss of nucleated cells.

Validation refers to establishing documented evidence that provides a high degree of assurance that a specific process will consistently produce a CB unit meeting its predetermined specifications and quality attributes. A process is validated to evaluate the performance of a system with regard to its effectiveness based on intended use.

Part B CORD BLOOD BANK STNDARDS

B1.000 DEFINITION OF A CORD BLOOD BANK

The Cord Blood Bank (CBB) consists of an integrated team responsible for the collection, processing, testing, banking, selection and release of CB cells for allogeneic and/or autologous hematopoietic progenitor cell transplantation. The CBB shall have a defined managerial structure, under a single Director with adequate staff and facilities, and written policies and protocols for all procedures performed by the CBB including staff training, competency and quality management.

B1.100 A CBB that includes multiple collection sites shall employ common protocols, staff training and competency evaluation procedures, quality assessment systems, and shall demonstrate evidence of regular interaction between these sites and the bank.

B1.200 The CBB and each collection site shall meet the AsiaCORD Standards for collection, processing, testing, banking, selection and release of CB units for clinical use.

B1.300 The CBB shall operate in compliance with local and national licensing requirements, these standards and all applicable governmental regulations.

B2.000 CORD BLOOD BANK FACILITY REQUIREMENTS

B2.100 These shall be designated facilities with adequate space for records; laboratory procedures; and preparation and safe, sanitary and orderly storage of the reagents and equipment needed for CB collection, processing, testing, banking, selection and release.

B2.200 The CBB shall be secure to prevent the admittance of unauthorized personal.

B2.300 The CBB shall utilize a Human Leukocyte Antigen (HLA) testing laboratory accredited by equivalent accrediting organization of each country.

B2.400 The CBB shall utilize a laboratory(ies) to perform all other tests required for evaluation of the mother or CB unit. The laboratory(ies) shall be accredited, certified or licensed to perform such testing in accordance

with governmental regulations.

B3.000 CORD BLOOD BANK SAFETY REQUIREMENTS

B3.100 The CBB shall have in operation programs designed to minimize risks to the health and safety of employees, donors, volunteers, and patients and shall operate in compliance with all applicable governmental safety regulations.

B3.200 The CBB shall have written policies and procedures for infection control, biosafety, chemical and radiation safety, emergency response to worksite accidents, and waste disposal, as appropriate.

B3.300 The CBB shall have written policies and procedures for action in case of exposure to communicable disease, or to chemical, biological or radiological hazards.

B3.400 Decontamination and disposal techniques for medical waste shall be described. Human tissue shall be disposed in such a manner as to minimize hazard to facility personnel and the environment.

B4.000 CORD BLOOD BANK PERSONNEL REQUIREMENTS

B4.100 The CBB shall maintain a written description of its organizational structure.

B4.200 There shall be a CBB Director who has final responsibility for the CBB scientific and clinical performance and its overall compliance with these Standards. The CBB Director shall have earned a doctoral degree in medicine, or in a related scientific field, with postdoctoral training in immunogenetics of transplantation, basic or clinical immunology, immunohematology, blood or tissue banking or cryobiology. The CBB Director should participate regularly in educational activities related to the field of hematopoietic progenitor cell collection, processing, transplantation and/or CB banking.

B4.300 There shall be a CBB Medical Director who is a licensed physician with postdoctoral training in hematopoietic cell transplantation of blood and tissue banking. This individual is directly responsible for the medical aspects of the collection procedures and compliance of the collection facilities with these Standards. The CBB Medical Director should

participate regularly in educational activities related to the field of hematopoietic progenitor cell collection, processing, transplantation and/or CB banking.

B4.310 Where there are remote collection facilities shipping CB cells to a central laboratory, the CBB Medical Director may serve the function of that remote collection facility Medical Director, and need not be licensed in the jurisdiction of the collection or be on the staff of the collection facility.

B4.320 The CBB Medical Director may also serve the CBB Director and/or CBB Laboratory Director if appropriately credentialed.

B4.400 There shall be a CBB Laboratory Director who is an individual with a relevant doctoral degree, qualified by postdoctoral training or experience for the scope of activities carried out in the CB processing facility. The CBB Laboratory Director is responsible for all procedures and administrative operations of the processing facility, including compliance with these Standards. The CBB Laboratory Director should participate regularly in educational activities related to the field of hematopoetic progenitor cell collection, processing, transplantation and/or CB banking.

B4.410 The CBB Laboratory Director may also serve as the CBB Director and/or CBB Medical Director if appropriately credentialed.

B4.500 There shall be a CBB Quality Management Supervisor designated by the CBB Director, to establish and maintain systems to review, modify as necessary, approve and implement all procedures intended to monitor compliance with these Standards and/or the performance of the facility. The CBB Quality Management Supervisor should participate regularly in educational activities related to the field of hematopoietic cell transplantation and/or CB banking quality management.

B4.600 The CBB shall have adequate staff whose training, continuing education, and continued competency for the performance of all operations shall be documented.

B5.000 QUALITY MANAGEMENT REQUIREMENTS

The CBB shall establish and maintain a program of quality assessment and improvement. The quality program shall cover all aspects of CB collection, processing, testing, banking, selection and release.

B5.100 Policies And Procedures

B5.110 The CBB shall have clearly written policies and procedures, that address all aspects of the operation. These shall be appropriately titled and follow a common format and system of numbering. Work instructions shall be precise and unambiguous and include the objective addressed; personal responsible for its execution; the facility, equipment, and supplies required; and the expected range of results. Where appropriate, there shall also be examples of correctly completed worksheets, forms and reports, scientific or technical references and the results of validation studies.

Here shall be policies and procedures to cover at least the following CBB operations:

B5.111 Preparation, approval, implementation and modification of standard operating procedures.

B5.112 Maternal screening and consent.

B5.113 CB collection and transport to processing laboratory.

B5.114 CB processing, cryopreservation, storage and expiration dates.

B5.115 Labeling.

B5.116 Infectious disease, immunogenetic typing, and other testing.

B5.117 Notification of mother or their responsible physicians of positive or indeterminate test results according to local or national regulations.

B5.118 Criteria for release of CB units including non-conforming units, formal issuing of CB units, and shipping of CB units to Transplant Centers.

B5.119 Quality management including quality assessment, improvement and corrective actions, and errors and accident reporting.

B5.1110 Data management, search request, donor matching to candidate recipients and selection of CB units.

B5.1111 Procedures for collection and analysis of transplant

outcome data.

B5.1112 Personal training and documentation of continued competency for the procedures performed.

B5.1113 Laboratory management including supplies, maintenance and monitoring of equipment, cleaning and sanitation procedures, disposal of medical and biohazardous waste, emergency and safety procedures, and a disaster plan.

B5.120 Policies and Procedures Management Requirements

B5.121 All policies and procedures shall comply with these Standards.

B5.122 The policies and procedures shall carry the signature of the CBB Director and the data of initial implementation. They shall be reviewed by the CBB Director or designee, signed and dated at least annually, and after each revision.

B5.123 Copies of the policies and procedures of the CBB shall be available to the CBB personnel at all times.

B5.124 The CBB shall record and maintain archived procedures and protocols in their historical sequence indefinitely, including inclusive dates of use.

B5.125 The policies and procedures for collection and processing of CB units and the manufacturing of supplies and reagents, shall define the objectives of the procedures, acceptable end-points, and the range of expected results.

B5.126 The CBB Director or designee shall review all deviations from the CBB policies and/or procedures or from these Standards. This review and associated training shall be documented.

B5.130 All personnel shall follow the policies and procedures established by the CBB.

B5.140 Operational Requirements

B5.141 There shall be a system to maintain the confidentiality of the CB donor and recipient, according to applicable laws governing confidentiality of health information.

B5.142 There shall be a system to confirm the correct identification of the CB unit, reference samples and,

maternal samples.

B5.143 There shall be a system capable of tracking and tracing all CB units and samples between donor and recipient.

B5.144 There shall be a system to confirm that test results for the CB units and maternal samples are within specifications prior to acceptance for release.

B5.145 In the case of multiple collection facilities, the responsibilities of the collection facilities and the processing laboratory for all aspects of processing, collection, testing, banking, storage and release shall be clearly defined. The CBB Director shall be ultimately responsible for the entire operation.

B5.146 The CBB shall use methods, equipment and supplies to maintain the viability of the CB units and to prevent the introduction of adventitious agents.

B5.300 Non-Conforming Units

B5.310 The CBB shall have a system for the identification of any units that do not fully meet these standards and the facility requirements.

B5.320 The CBB shall maintain a record of non-conforming units that are banked and/or released. The nature of the nonconformity shall be communicated to the Transplant Facility when one such unit is proposed for clinical use.

B5.400 Errors And Accident Reporting Requirements

The CBB shall have a system and procedure for monitoring, detecting, documenting and reporting deviations, errors and accidents. These shall be evaluated by the appropriate Director and/or Medical Director together with the Quality Management and other appropriate staff.

B5.410 Corrective actions shall be implemented and documented by the appropriate Director of the involved facility.

B5.420 The CBB Director or Medical Director shall designate a time at which the outcome of the corrective actions shall be evaluated.

B5.500 Adverse Reaction Files

B5.510 Records shall be maintained of all severe or unexpected adverse

reactions in the mother or infant arising as a result of collection of the CB unit.

B5.520 Records shall be maintained of all severe or unexpected adverse reactions resulting from transplantation of the CB unit, including acute toxicity associated with infusion of the CB unit and failed engraftment Section E8.000 applies.

B5.530 A thorough investigation of each reported adverse reaction shall be made by the bank in collaboration with the collection facility and/or transplant program. A written report of the investigation including conclusions, follow-up, and corrective action, if applicable, shall be prepared and maintained as part of the record for that final CB unit.

B5.540 When it is determined that the CB unit was responsible for the adverse reaction, copies of the written reports shall be forwarded to the Transplant Facility involved.

B5.600 Clinical Outcome Data Requirements

For unrelated allogeneic, related allogeneic and autologous CB units released, the CBB shall maintain details of clinical outcome as necessary to assure that the procedures in use in the CBB continuously provide a safe and effective component. Sections E5.000 and E8.000 apply.

B5.610 For unrelated allogeneic, related allogeneic and autologous CB units, data shall include records of neutrophil and platelet engraftment.

B5.620 For unrelated allogeneic, related allogeneic and autologous CB units, data should include survival rates.

B5.630 For unrelated and related allogeneic CB units only data should include chimerism and GVHD results.

B5.700 Validation And Qualification Requirements

B5.710 Procedures shall be developed, implemented, and documented for the validation of qualification of significant aspects or the CBB functions. Determination of which elements are to be validated or qualified shall be made by the CBB Director(s) in collaboration with the Quality Management program. Section D9.000 applies.

B5.720 Records shall be maintained to document that procedures have been validated to achieve the expected end points.

B5.730 Successful validation shall be signed and dated and shall be accompanied, when appropriate, by quality control procedures developed specifically to monitor the continuing adequacy of the procedures, reagents, equipment and supplies as used under routine operating conditions by the CBB personnel. Validation studies shall be reviewed and approved by the CBB Director, or designee from the quality assurance program.

B6.000 INSTITUTIONAL REVIEW BOARD REQUIREMENTS

B6.100 In compliance with governmental regulations, the CBB shall have formal review of investigational protocols for CB collection or consent by a mechanism that is approved by the Office of Human Research Protections under the Department of Health and Human Services (HHS), the Food and Drug Administration (FDA), or by equivalent health agencies outside the United States.

B6.200 The CBB shall maintain documentation of all research protocols, Institutional Review Board approvals, investigational new drug or device exemptions, annual reports, and any adverse outcome reports.

B7.000 INDENTIFICATION AND LABELING REQUIREMENTS

B7.100 Labeling Operations

B7.110 Labeling operations shall be conducted in a manner adequate to prevent mislabeling of CB units and reference samples.

B7.120 There shall be a bar-coding or equivalent human-and machine-readable system of identification for the maternal specimen, the CB unit, reference samples and their associated documents. The identification system shall be validated.

B7.130 The labeling operation shall include at least the following controls:

B7.131 Labels shall be held upon receipt from the manufacturer pending review and proofing against an approved copy to ensure accuracy regarding identity, content, and conformity.

B7.132 Stocks of unused labels representing different

components shall be stored and maintained in a manner to prevent errors. Stocks of obsolete labels shall be destroyed.

B7.133 A system of checks in labeling procedures shall be used to prevent errors in transferring information to labels.

B7.134 All labeling shall be clear and legible and printed using indelible ink.

B7.135 The labeling system shall be validated as reliable for storage under the conditions in use.

B7.140 The information provided on the label by the initial collection facility shall be maintained indefinitely as part of the CB processing record.

B7.141 CB units that are subsequently processed may be packaged into new bags with new labels as appropriate. The establishment of this linkage shall be validated.

B7.150 When the label has been affixed to the bag, a sufficient area of the bag shall remain uncovered to permit inspection of the contents.

B7.200 Identification

B7.210 Each CB unit shall be assigned a unique numeric or alphanumeric identifier by which it will be possible to relate any CB unit to its maternal and infant data, delivery information, family history, test results, and to all records describing the handling and final disposition of that CB unit.

B7.220 Facilities may designate an additional or supplementary unique numeric or alphanumeric identifier to the CB unit or to a testaliquot. Supplementary identifiers shall not obscure the original identifier. No more than one supplementary identifier shall be visible on a CB unit bag.

B7.300 Partial Label

B7.310 If the collection or freezing bag is capable of bearing only a partial label, the container shall show at a minimum the proper name “Cord Blood” and the unique numeric or alphanumeric identifier of the CB unit.

B7.311 For related allogeneic or autologous donations, the

name and/or identifier of the intended recipient, if known, shall be included.

B7.320 At time of issue for infusion or transfer to another facility, collection bags bearing a partial label shall be accompanied by the full information in Section C4.600, and freezing bags bearing a partial label shall be accompanied by the full information in Section D5.000. Such information shall be attached securely to the CB unit on a tie tag or enclosed in a sealed package.

B7.330 For labeling at the completion of collection, Section C4.600 applies.

B7.340 For labeling at the completion of processing. Section D5.000 applies.

B7.350 For labeling at time of issue for transplantation, Sections E5.500 and E5.600 apply.

B8.000 SUPPLIES, REAGENTS AND EQUIPMENT REQUIREMENTS

B8.100 There shall be a program of quality assurance that is sufficiently comprehensive to ensure that reagents, equipment and procedures function as expected.

B8.200 All supplies and reagents used in the collection, processing, freezing, and infusion of the CB unit that come into contact with the CB shall be sterile, including those reagents manufactured by the processing facility.

B8.300 Supplies and reagents should be used in a manner consistent with instructions provided by the manufacturer.

B8.400 Whenever possible, supplies and reagents used for CB collection, processing and cryopreservation shall be approved for human use.

B8.500 Supplies and reagents not approved for human use may be used if.

B8.510 The supplies or reagents are specified in a procedure that has received Institutional Review Board approval at the each bank, and/or Investigational New Drug or Device Exemption (or equivalent outside the United States), or

B8.520 The procedure that includes the specified supplies or reagents has been used in Institutional Review Board-approved trials and has been established in the medical literature to be acceptable for the purpose(s) specified.

B8.600 Equipment used in the collection, processing, testing, freezing, storage, transportation, and infusion of CB shall be maintained in a clean and orderly manner and located so as to facilitate cleaning and maintenance.

B8.610 Equipment shall be observed, tested and calibrated on a regularly scheduled basis as described in standard operating procedures.

B9.000 RECORDS REQUIREMENTS

B9.100 General Records Requirements

B9.110 Records shall be made concurrently with each stage of the CB collection, processing, testing, banking, selection, release, transplantation and/or disposal of each CB unit in such a way that all steps may be accurately traced.

B9.120 Records shall be legible and indelible, shall identify the person immediately responsible for each step, and shall include dates (and times where appropriate).

B9.130 Records of each step shall be as detailed as necessary for a clear understanding by a person experienced in CBB procedures and shall be available for inspection by authorized individuals.

B9.140 Records shall be available from which to determine the lot number, expiration date and manufacturer of supplies and reagents used for the collection and processing of each CB unit.

B9.150 Records shall be maintained in such a way as to assure their protection and preservation.

B9.160 Records related directly to the collection, processing, testing, banking, selection and/or release of CB units shall be maintained indefinitely.

B9.170 Records related to quality control, personnel training or competency, equipment maintenance, sterilization of supplies and reagents, disposition of rejected supplies and reagents, or other laboratory management issues shall be retained for 10 years by the CB collection or processing facilities, although not all need be immediately available. Section B9.300 applies.

B9.200 Confidentiality Of Donor And Family In The Records

B9.210 All records and communications among the collection, processing and transplant facilities and their patients shall be regarded as

privileged and confidential.

B9.220 Informed consent shall include knowledge that linkage of donor and mother with the CB unit is maintained. Section C2.000 applies.

B9.230 The CBB shall have written policies and procedures for circumstances where donor, mother or donor's legal guardian and appropriate medical personnel could be contacted.

B9.240 There shall be a system to maintain the confidentiality of the donor, family, and recipient that shall be secure within the CBB such that demographic data are available only when needed and only to authorized personnel.

B9.300 Records To Be Maintained

Records that shall be maintained include the following. Sections B9.160, B9.170 and B9.200 apply.

B9.310 Donor and parental records– indefinite retention

B9.311 Medical history of the biological mother; the birth mother if applicable; and the biological father, if his history is available; copies of consent forms; and results of laboratory tests.

B9.312 Mother's full name, address; neonatal delivery date; and if available, infant's full name and address and father's full name and address.

B9.313 Maternal or infant adverse reactions, complaints and reports, including results of all investigations and followup.

B9.320 CB Unit Records– indefinite retention

B9.321 Identity of all facilities involved in the collection, processing, testing, banking, selection and release of the CB unit.

B9.322 CB unit processing worksheets including lot numbers and expiration dates of reagents and supplies used.

B9.323 Documentation and interpretation of all test results.

B9.324 Records of cryopreservation procedure and storage, identified by device, date and CB unit identifier.

B9.325 Results of confirmatory testing performed prior to CB

unit release.

B9.326 Distribution and disposition of CB units.

B9.327 Reasons for exclusion of CB units collected but not banked.

B9.330 Quality assurance records– minimum 10-year retention

B9.331 Periodic performance checks of equipment and reagents.

B9.332 Tests of capacity of shipping containers to maintain proper temperature in transit.

B9.333 Proficiency test results.

B9.334 Validation studies.

B9.335 Results of inspection and accreditation visits.

B9.340 General records– minimum 10-year retention

B9.341 Sterilization of supplies and reagents prepared within the facility, including date, time interval, temperature and method used.

B9.342 Personnel employed by the CBB responsible for CB unit collection and processing, their signature, initials and inclusive dates of employment.

B9.343 Technical personnel training, continuing education, and periodic competency testing.

B9.344 Errors and accidents and corrective action taken.

B9.345 Maintenance records for equipment and facilities

B9.346 Supplies and reagents, including name of manufacturer of supplier, lot numbers, date or receipt and expiration.

B9.347 Disposition of rejected supplies and reagents.

B9.400 Electronic Records

B9.410 If an electronic record-keeping system is used, there shall be a system to ensure the authenticity, integrity and confidentiality of all records.

B9.420 There shall be protection of the records to enable their accurate and ready retrieval throughout the period of record retention.

B9.430 The facility shall have an alternative system that ensures continuous operation in the event that primary electronic data are not available. The alternative system shall be tested periodically.

B9.440 There shall be established written procedures for record entry, verification and revision. A system shall be established for display of data before final acceptance.

B9.441 The quality assurance system shall include an assessment of electronic functions to ensure that errors and problems are reported and resolved.

B9.450 There shall be a system whereby access is limited to authorized individuals.

B9.460 There shall be the ability to generate true copies of the records in both paper and electronic forms suitable for inspection and review.

B9.470 When a computer system is used, there shall be validated procedures for and documentation of:

B9.471 Systems development.

B9.472 Numerical designation of system versions if applicable.

B9.473 Prospective validation of system, including hardware, software, database and peripheral devices.

B9.474 Installation of the system.

B9.475 Training and continuing competency of personnel in systems use.

B9.476 Monitoring of data integrity.

B9.477 System maintenance and operations.

B9.480 All system modifications shall be authorized, documented, and validated prior to implementation. Documentation shall be complete, in a language understandable by users.

B9.490 The computer system shall ensure that all donor, unit, and patient identifiers are unique.

B9.500 Records In Case Of Divided Responsibility

B9.510 If two or more facilities participate in the collection, processing of transplantation or the CB unit, the records of each facility shall show plainly the extent of its responsibility

B9.520 Each participating facility shall furnish to the facility of final disposition a copy of records relating to the collection and processing procedures performed in so far as they concern the safety of the CB unit.

PART C: CORD BLOOD DONOR AND COLLECTION STANDARDS

C1.000 DONOR EVALUATION

C1.100 There shall be donor evaluation procedures in place that protect the recipient against transmitted disease and also protect the safety and confidentiality of the CB donor and mother. Both the potential for disease transmission from the donor to the recipient and the risks to the donor and mother from the collection procedure shall be assessed. Donor and maternal evaluation test results shall be documented.

C1.110 Any abnormal findings that suggest infection in mother or infant shall be reported to the mother and/or her physician in writing. If the abnormality is potentially urgent, the mother's or infant's physician should be notified immediately.

C1.120 When a mother does not meet the criteria below, the CB Collection Center Director or Medical Director shall document and maintain in the permanent record the nature of the variances and the rationale for inclusion of that CB unit.

C1.200 Maternal and CB Donor Screening and Testing

C1.210 There shall be written criteria for CB donor selection.

C1.220 A genetic history shall be obtained and documented from the biologic mother, and if available, from the father. The history should include the infant's ethnicity (mother's and father's family including parents and grandparents) and the potential presence of inherited disorders of the hematopoietic or immunologic systems.

C1.230 A medical history for mother's infectious risk behavior shall be obtained and documented.

C1.231 This history shall include mother's prenatal infectious disease testing, if known, and results of other general medical testing that could influence infectious disease and/or genetic disease transmission.

C1.232 In the case of a surrogate mother who carries to delivery a fertilized egg, an infectious disease risk history of the surrogate shall also be obtained and documented.

C1.233 History of the current pregnancy and delivery, and

infant's birth data shall be obtained and documented, including gender, gestational age, and if available, other results of clinical examination and any disease diagnosed prior to discharge.

C1.234 At the time of delivery, previously obtained history for infectious disease transmission risk shall be updated.

C1.235 A blood sample from the birth mother shall be tested for blood borne pathogens at the time of or up to 7 days after collection of the CB unit.

C1.2351 Blood borne pathogen testing shall include anti-HIV-1, anti-HIV-2, HIV-1-Ag, anti-HTLV I/II, HBsAg, anti-HBc, anti-HCV, a serological test for syphilis and any additional testing required by governmental regulation at the time of collection. Testing should include anti-CMV.

C1.2352 Positive or indeterminate test results, excluding CMV, shall be communicated to the mother and/or her physician, and according to governmental reporting laws.

C1.236 The CBB shall have a written policy directing response to indeterminate or positive results found during the screening process and laboratory testing of maternal or CB samples.

C1.237 CB shall not be accepted for unrelated donor transplantation if there is a family history (biologic mother, father, or sibling) of a genetic disorder that may affect the recipient for which there is no test available or inadequate follow-up to ensure the safety of the CB unit.

C2.000 INFORMED CONSENT

C2.100 Informed consent shall be obtained from the biologic mother prior to or within 7 days after delivery of the infant. Consent for CB collection shall be obtained prior to the collection procedure when CB is collected with the placenta in utero.

C2.110 In cases of a surrogate mother, informed consent shall be obtained from both the surrogate and the biologic mother.

C2.120 Informed consent should not be obtained while the mother is in active labor.

C2.200 The formal aspects of participation in the CBB shall be discussed with the mother in language with which she feels comfortable. The explanations shall include at least the overall purpose; the possible risks, benefits, and alternatives of CB donation to the mother or infant including medical and ethical concerns; and the right of the mother to refuse without prejudice.

C2.300 There shall be an informed consent process that includes the elements in C2.200 and at least the following.

C2.310 Donation of the CB for use in transplantation specifying the intent of the donation.

C2.311 If the collection is for unrelated allogeneic transplantation, the CB unit is a donation that will be made available to other individuals and will not necessarily be available to the donor or the donor's family at a later date.

C2.312 If the collection is intended for related allogeneic or autologous transplantation, the release of the CB unit will be limited respectively to the specified family recipients or the donor.

C2.320 Interview for personal and family medical history.

C2.330 Review of the medical record of the mother and infant.

C2.340 The CB collection procedure.

C2.350 Collection of blood from the mother and infectious and genetic disease testing on the CB unit and maternal blood as applicable.

C2.360 Storage of reference samples for future testing.

C2.370 Maintenance of linkage, whenever possible, for the purpose of notifying donor/family of infectious or genetic diseases. Section B9.200 applies.

C2.380 Use of CB unit for research, quality control or validation studies.

C2.390 Disposal or release of CB units not meeting criteria for banking.

C3.000 CORD BLOOD COLLECTION FACILITIES

C3.100 The Collection Facility refers to the site where the infant is delivered and the CB unit is collected.

C3.200 There shall be a CB Collection Facility Medical Director who is a licensed physician. The CB Collection Facility Medical Director shall be responsible for the medical aspects of CB collection procedures and compliance of the CB Collection Facility with these Standards.

C3.210 Where there are remote collection facilities shipping CB to a central laboratory, the CBB Medical Director may serve as the Collection Facility Medical Director, and need not be licensed in the jurisdiction of the collection or be on the staff of the facility where the collection takes place.

C3.220 In utero collections shall be performed by a physician, midwife or nurse trained in the collection procedure and licensed to practice in the jurisdiction where the collection takes place.

C3.300 There shall be adequate numbers of trained collection personnel available at the facility where the collection is performed. Training shall be specific for the function to be performed, and shall be documented.

C3.400 There shall be a designated area for appropriate preparation and storage of the reagents, supplies and equipment needed for the collection procedures.

C3.500 There shall be adequate space for the performance of the collection procedure.

C3.600 There shall be adequate space for storing the CB unit temporarily until it is transported to the laboratory.

C3.700 There shall be emergency medical care available for the mother and infant.

C4.000 CORD BLOOD COLLECTION PROCEDURES

C4.100 CB collection procedures and practices shall protect mother and infant.

C4.110 Delivery practices shall not be modified in attempt to increase CB volume.

C4.200 When in utero CB collection is performed there shall be additional safeguards in place to ensure safety of mother and infant.

C4.210 CB collections should only be performed in utero from documented singleton deliveries.

C4.211 If CB collection is performed in utero in a multiple gestation pregnancy, all infants shall be delivered before any CB collection begins.

C4.220 In utero CB collections shall only occur in uncomplicated deliveries.

C4.230 CB units shall be obtained in utero from infants after at least 34 weeks gestation.

C4.300 Collection of CB shall be performed according to written policies and procedures

C4.310 Methods for collection shall employ aseptic technique and shall use procedures validated to result in acceptable progenitor cell viability and recovery. Section B5.700 applies.

C4.320 The primary CB collection bag shall be approved for use in collecting human blood and shall be used and sealed in a manner that minimizes the risk of cell loss and of microbial contamination.

C4.330 All reagents and supplies for collection that come into contact with the CB shall be sterile. Section B8.200 applies.

C4.340 Lot numbers and expiration dates of reagents and disposables used in the collection procedures shall be recorded and sent to the CBB. Sections B9.140 and B9.346 apply.

C4.400 There shall be a unique identifier for the CB unit, samples, and data forms. Section B7.200 applies.

C4.500 There shall be a written policy at the collection site for labeling of CB unit. Section B7.000 applies.

C4.600 On completion of collection, the primary collection bag shall bear the following information.

C4.610 The CB unit's unique numeric or alphanumeric identifier.

C4.620 The proper name of the CB unit “Cord Blood” in a prominent position.

C4.630 The collection center identifier, and the donor identifier.

C4.640 Name of physician, date and time of collection (and time zone if applicable).

C4.650 Name and volume of anticoagulant and any other additives.

C4.660 The approximate volume of the collection.

C4.670 For related allogeneic and autologous directed donations: the

donor's name and, if applicable, the recipient's name and a unique patient identifier or other identifier of intended recipient or family.

C4.700 There shall be a written policy for storage of CB units and samples at the collection site prior to transport to the processing facility.

C4.800 Records shall be maintained of all reports of adverse reactions that occur during or immediately after collection. Section B9.000 applies.

C5.000 TRANSPORTATION OF NON-CRYOPRESERVED CORD BLOOD UNITS BETWEEN CORD BLOOD COLLECTION SITE/FACILITY AND THE CORD BLOOD PROCESSING LABORATORY

C5.100 The methods of transportation of the CB unit between the collection site and the processing laboratory shall be designed to protect the integrity of the unit being transported and the health and safety of facility personnel.

C5.200 The primary CB collection bag shall be placed in a sealed secondary plastic bag to contain any leakage from the primary bag.

C5.300 Shipping Container (Box)

C5.310 The shipping container shall be of a design to minimize temperature changes during transportation.

C5.320 Transportation of CB units shall be in compliance with applicable governmental laws. The outer shipping container shall be made of material adequate to withstand leakage of contents, shocks, pressure changes, and other conditions incident to ordinary handling in transportation.

C5.330 The shipping container shall carry the following labels.

C5.331 “Cord Blood for Transplantation”, a label indicating that the shipment should not be exposed to radiation, and an appropriate biohazard label in compliance with regulations for the transport of human blood.

C5.332 The shipping container shall also include the name, address and phone number of the shipping facility; the name, address, and phone number of the receiving facility; and the name of the person responsible for receipt of the shipment.

C5.400 Transport Records

C5.410 Transport records shall permit the tracing of the CB unit from the collection facility to its final destination.

C5.420 Transport records shall identify the source facility responsible for shipping the CB unit, and the date and time of shipping and receipt of the unit.

C5.430 Transport records shall document the identity of the courier, if pertinent and the date and time of receipt of the package.

C5.440 A shipping list identifying each unit enclosed in a package shall be included.

C5.450 Transport records shall be maintained indefinitely.

PART D: CORD BLOOD PROCESSING STANDARDS

D1.000 GENERAL REQUIREMENTS

D1.100 Laboratory Facilities

Section B2.000 applies.

D1.200 Safety

Section B3.000 applies.

D1.300 Personnel

Section B4.000 applies.

D1.400 Supplies And Reagents

Sections B8.100 through B8.500 apply.

D1.500 Equipment

Sections B8.100 and B8.600 apply.

D2.000 CORD BLOOD PROCESSING

D2.100 General Principles

D2.110 A CBB shall use collection facilities that meet AsiaCORD Standards with respect to its interaction with that CB Processing Facility.

D2.120 Prior to processing any CB unit, there shall be a written agreement between the CBB and the facility where the unit was collected of the collection team.

D2.130 In the case of related allogeneic or autologous directed donors, a written physician's order for processing and storage shall be obtained including the name of the intended recipient, if known.

D2.140 Processing of CB units shall be performed according to a validated Standard Operating Procedure.

D2.150 CB units shall be processed and frozen within 48 hours of collection using a controlled rate freezing method.

D2.160 Unless included in an IRB-approved protocol or equivalent governmental regulatory oversight, CB unit processing shall be restricted to volume reduction by depletion of erythrocytes and/or plasma.

D2.170 Any other manipulation as defined in D5.160 shall only be

performed:

D2.171 with Institutional Review Board approval or its equivalent the appropriate governmental agency, or

D2.172 using reagents and/or devices approved for that manipulation by the appropriate governmental agency.

D3.000 REVIEW OF PROCESSING RECORDS

Records pertinent to the CB unit shall be regularly reviewed by the Laboratory Director or designee. Failure of the processing procedure to achieve acceptable endpoints shall be evaluated and documented.

D4.000 REFERENCE SAMPLES

D4.100 The following samples shall be collected from the unrelated allogeneic, related allogeneic, or autologous CB units prior to cryopreservation.

D4.110 A reference aliquot of each CB unit that is stored for clinical use shall be sealed in the tubing tha is integrally attached to the freezing bag.

D4.120 At a minimum, the following samples from each CB unit shall be stored and available for testing.

D4.121 Serum or plasma from non-heparinized samples (at least 2 vials, 2 ml each; should be stored at below -18℃).

D4.122 Cells cryopreserved in a manner to maintain viability (at least 2 vials with 1-2×106 mononuclear cells per vial) stored under conditions to maintain long-term viability.

D4.123 Suitable material for preparation of at least 50 μg genomic DNA. This may be purified DNA, frozen cellular material or blots.

D4.200 The following samples for unrelated allogeneic CB units shall be collected from the CB donor's mother at, or after the time of CB unit collection, but prior to release of that unit.

D4.210 From the birth mother: Serum or plasma from non-heparinized samples (at least 2 vials, 2 ml each, should be stored at below

-18℃).

D4.220 From the biologic mother: Suitable material for preparation of at least 50 μg genomic DAN. This may be purified DAN, frozen cellular material or blots.

D5.000 LABEL AT COMPLETION OF PROCESSING

D5.100 Upon completion of processing, and before release to a transplant facility, the label on the CB unit shall bear the following information.

D5.110 The CB unit's unique numeric of alphanumeric identifier.

D5.120 The proper name, “Cord Blood”, any appropriate modifier(s), and a statement to indicate intended recipient and unit identification must occur before infusion and a warning that this CB unit may transmit infectious agents.

D5.121 Each CB unit intended for autologous use shall be prominently labeled “For Autologous Use Only” and the donor/recipient's name and unique patient identifier.

D5.122 Each CB unit intended for directed allogeneic use shall be prominently labeled: “For Use By Intended Recipient Only” and the recipient's name and unique patient identifier, if known.

D5.130 The ABO group and Rh type of the donor conspicuously designated.

D5.140 Name and volume of any additive including, but not limited to, anticoagulant, electrolyte solutions, and/or cryoprotectant.

D5.150 The approximate volume of the CB unit.

D5.160 Method(s) used for CB unit manipulation, if applicable, including but not limited to: depletion, positive-selection, ex vivo expansion and gene-manipulation.

D5.170 The recommended storage temperature range of the CB unit in degrees Celsius.

D5.180 The name and address of the processing facility.

D5.190 A BIOHAZARD label if indicated.

D5.200 If the space on the CB unit does not allow for a complete label, a partial label as defined in B7.300 shall be used.

D6.000 CRYOPRESERVATION

D6.100 CB units shall be cryopreserved using a controlled rate freezing procedure validated to maintain viability. Any other cryopreservation technique shall be validated to maintain viability. Section B5.700 applies.

D6.200 Frozen CB units shall be stored in approved freezing bags designed for the cryopreservation of human cells and placed into metal canisters to provide protection during freezing, storage and transportation. Any other cryopreservation system shall be validated.

D6.210 Each CB unit freezing bag and its satellite container(s), if any, shall be examined visually for damage or possible contamination prior to its use and immediately after filling. Such examination shall include inspection for breakage of seals. The results of this inspection shall be documented.

D6.300 Cryopreservation protocols shall specify the following:

D6.310 The cryoprotectant and its final concentration.

D6.320 Total nucleated cell concentration.

D6.330 Method of freezing and endpoint temperature of cooling.

D6.340 Cooling rate.

D6.341 A record of the cooling rate shall be archived for each CB unit that is frozen.

D6.350 Storage temperature.

D6.360 The procedure shall minimize transit time of frozen units between freezing and storage devices.

D7.000 CONDITIONS FOR STORAGE

D7.100 CB units shall be maintained in quarantine storage until all infectious disease test results have been obtained, and the CBB Director or designee has reviewed the record and approved the CB unit for permanent storage.

D7.110 Records shall indicate when CB unit was released from quarantine and placed in permanent storage.

D7.120 CB units with positive or indeterminate test results for HIV, HTLV, HCV or HBsAg shall be maintained in permanent quarantine storage.

D7.130 CB units intended for unrelated or related allogeneic use that are positive for HIV shall not be used for human transplantation.

D7.200 Facilities storing CB units shall establish policies for the duration and conditions of storage and indications for discard.

D7.210 Refrigerators and freezers used for the storage of specimens, CB units, blood components, human tissues, or reagents shall not be used for any other purpose.

D7.220 There shall be a written procedure for the transport and alternate place of storage of CB units in the event of a disaster.

D7.300 Security

D7.310 The storage device shall be located in a secure area and shall have locking capability that is used at least when the area is not occupied.

D7.400 An inventory control system shall be operational. Such a system shall be able to locate any CB unit and its available associated reference samples.

D7.500 Temoerature

D7.510 Frozen storage shall be at a temperature no higher than -135℃ and within a temperature range determined to be appropriate for the cryoprotectant and defined in the standard operating procedures.

D7.520 For CB units stored in liquid nitrogen, procedures to minimize the risk of microbial cross-contamination of units shall be defined and maintained.

D7.530 Exposure of frozen units to temperature fluctuations shall be minimized.

D7.600 Monitoring And Alarm Systems

D7.610 Freezers for CB unit storage shall have a system to monitor the temperature continuously and to record the temperature at least every 4 hours.

D7.611 For CB units fully immersed in liquid nitrogen, continuous temperature monitoring is not required.

D7.620 Liquid nitrogen freezers shall have a mechanism to ensure that adequate levels of nitrogen are maintained.

D7.630 Alarm Systems

D7.631 Storage devices shall have alarm systems that are

continuously active.

D7.632 Alarm systems shall have audible and visible signals.

D7.633 The alarm system shall be capable of notifying designated personnel 24 hours a day.

D7.6331 A standard operating procedure for notifying designated staff shall be placed at each remote alarm location and in the immediate area of the storage device.

D7.634 Alarm parameters shall be set to allow staff sufficient time to salvage CB units.

D7.635 Alarm systems shall be checked periodically for function. The records of such checks shall be maintained and be available for inspection.

D8.000 DISPOSAL

D8.100 There shall be a written policy for disposal of discarded CB units.

D8.200 The records for discarded CB units shall indicate the unique identifier of the unit, and the reason, date and method of disposal.

D8.300 For related allogeneic and autologous directed CB units, there shall be written documentation of patient death or no further need for the unit before any unit is discarded. It the donor is alive, informed consent for disposal shall be obtained.

D8.310 The CBB Director or designee in consultation with the patient's transplant physician shall approve of the unit disposition.

D8.320 If the patient is still alive his/her consent for disposition of the units shall be obtained. If consent is denied, the patient shall be offered the opportunity to transfer the CB unit to another facility.

D8.400 In case of a minor donor, informed consent shall be obtained from the donor's biologic mother or legal guardian in accordance with applicable law.

D8.500 In the event the CBB is no longer able to maintain a related allogeneic or autologous directed unit in inventory, it is the responsibility of the CBB to provide for appropriate storage of the unit in another accredited CBB facility and to inform the patient of this.

D9.000 QUALITY MANAGEMENT

Section B5.000 applies.

D9.100 Laboratory Controls

D9.110 Laboratory control procedures shall include.

D9.111 The establishment of scientifically sound appropriate assays, standards and test procedures for the evaluation of the CB unit.

D9.112 Adequate provisions for monitoring the reliability, accuracy, precision and performance of laboratory test procedures and instruments.

D9.113 Adequate identification and handling of all test samples so that they are accurately related to the specific CB unit being tested, to its donor, or to the specific recipient, as applicable.

D9.200 Testing Of Cord Blood Units

D9.210 The following tests shall be performed on a pre-cryopreservation sample from each CB unit. If thawed samples are used, the laboratory shall demonstrate correlation with precryopreservation values.

D9.211 Total nucleated cell count from the final CB product at end of processing. Nucleated red blood cell count should be included.

D9.212 Total number of CD34-positive cells and/or total number of hematopoietic colony-forming cells from the final CB product at end of processing.

D9.213 Microbial cultures of CB units on a sample of CB obtained after processing using a system permissive for the growth of aerobic and anaerobic bacteria as well as fungi.

D9.2131 The results of positive microbial tests shall include identity of the organism(s). Antibiotic sensitivities for aerobic bacteria shall be performed prior to release of the CB unit for transplantation. These results shall be reported to

the prospective Transplant Facility.

D9.214 ABO group and Rh type.

D9.215 Human leukocyte antigen (HLA) type for unrelated allogeneic and related allogeneic use.

D9.2151 HLA-A, B and DRB1 loci shall be determined.

D9.2152 HLA-C, DQA and DQB should be determined.

D9.2153 HLA Class 1 typing may be performed by serological methods. Ambiguous results shall be confirmed by DNA techniques. All Class if typing shall be performed by DNA techniques.

D9.216 For unrelated allogeneic and related allogeneic CB units, hemoglobin electropheresis shall be performed in ethnic groups at high risk for hemoglobinopathies or where indicated by family history.

D9.220 Prior to release for transplantation, each CB unit shall be tested for HIV-1, HIV-2, HTLV-1, HTLV-11, HCV and HBsAg.

D9.230 If the CB unit is collected for related allogeneic or autologous use but then released for unrelated allogeneic use, samples shall meet full unrelated allogeneic banking criteria as described above. Sections B, C, and D apply.

PART E SELECTION, RELEASE AND SHIPPING OF CORD BLOOD UNITS

E1.000 GENERAL REQUIREMENTS FOR UNRELATED ALLOGENEIC CORD BLOOD UNITS

E1.100 The CBB shall have policies and procedures for the selection, release and transport of CB units to Transplant Facilities.

E1.200 The CBB shall maintain records on each search request.

E1.300 The CBB shall have an electronic record system that enables search and match operations.

E1.310 If an outside agency is used for search and match functions, their electronic record system shall meet AsiaCORD Standards (for the future).

E1.400 The CBB shall utilize validated procedures for the performance of donor-recipient matching and for reporting results within a defined time limit.

E1.500 There shall be a system to document requests for CB units, reference samples from units, requests for and results of testing, and transportation of units and samples between facilities.

E1.600 The CBB should have links or exchange agreements with other CBBs to facilitate the identification of optimal CB units for recipients.

E1.700 The CB unit should be received by the Transplant Facility prior to initiation of the recipient's preparative regimen.

E2.000 GENERAL REQUIREMENTS FOR RELATED ALLOGENEIC AND AUTOLOGOUS CORD BLOOD UNITS

E2.100 The CBB shall have policies and procedures for the selection, release and transport of CB units to Transplant Facilities.

E2.200 There shall be a system to document requests for CB units, reference samples from units, requests and results of testing, and transportation of units and samples between facilities.

E3.000 CORD BLOOD SELECTION FOR UNRELATED OR RELATED ALLOGENEIC CORD BLOOD TRANSPLANTATION

E3.100 Once a CB unit is identified for potential use, a sample of that unit shall be tested to verify HLA type and cell viability. Where possible, this sample shall be obtained from a contiguous segment. Section D4.100 applies.

E3.200 Samples of DNA (or material to isolate DNA) from the requested CB unit shall be provided to the Transplant Facility's designated HLA testing laboratory for confirmation of HLA type unless independently verified results have been previously obtained and documented.

E3.210 A copy of the results of such confirmatory testing shall be obtained, recorded, and provided to the CBB. This copy shall be archived and used in the future to support the identity of the sample when offering the CB unit to another Transplant Facility.

E3.300 Prior to release of a CB unit, the CBB shall provide to the Transplant Facility the following processing data, testing results and donor/maternal medical history.

E3.310 Total nucleated cell count of the CB unit at the end of processing, prior to cryopreservation. Nucleated red blood cell count should be included. Section D9.211 applies.

E3.320 Total number of CD34-positive cells or hernatopoietic colony forming cells. Section D9.212 applies.

E3.330 HLA Class I and II typing. Sections D9.215, E3.100 and E3.200 apply.

E3.340 Microbial testing results of the CB unit. If aerobic bacteria are documented in the CB unit, antibiotic sensitivities shall be provided. Section D9.213 applies.

E3.350 Infectious disease testing results performed on the maternal blood sample and on the CB unit. Sections C1.2351 and D9.220, respectively, apply.

E3.360 Risks of infectious and/or genetic diseases disclosed by the maternal medical and genetic screening or clinical chart review, and the results of any investigation or further testing performed.

E3.400 Confirmation of maternal haplotype should be provided.

E3.500 Prior to release for allogeneic transplantation, the CBB shall obtain or perform confirmatory HLA typing of the potential recipient's blood

unless this typing has been confirmed and updated on an independent sample by the original laboratory or by an independent HLA laboratory.

E3.600 Any variances in collection, processing, and/or storage procedures that may influence the integrity and/or quality of the CB unit shall be reported to the Transplant Facility. Section D9.200 applies.

E4.000 CORD BLOOD SELECTION FOR AUTOLOGOUS CORD BLOOD TRANSPLANTATION

E4.100 Once a CB unit is identified for potential use, a sample of that unit shall be tested to verify cell viability. Where possible, this sample should be obtained from a contiguous segment.

E4.200 Prior to release of a CB unit, the CBB shall provide to the Transplant Facility the following processing data, testing results and donor/maternal medical history.

E4.210 Total nucleated cell count of the CB unit at the end of processing, prior to cryopreservation. Nucleated red blood cell count should be included. Section D9.211 applies.

E4.220 Total number of CD34-positive cells or hematopoietic colony forming cells. Section D9.212 applies.

E4.230 Microbial testing results of the CB unit. If aerobic bacteria are documented in the CB unit, antibiotic sensitivities shall be provided. Section D9.213 applies.

E4.240 Infectious disease testing results performed on the maternal blood sample and on the CB unit. Sections C1.2351 and D9.220 apply.

E4.250 Results of infectious disease screening disclosed by the maternal medical history or clinical chart review, and the results of any investigation or further testing performed.

E4.300 Any variances in collection, processing, and/or storage procedures that may influence the integrity and/or quality of the CB unit shall be reported to the Transplant facility. Section D9.200 applies.

E5.000 CORD BLOOD UNIT RELEASE

E5.100 The CBB shall obtain a written request from the transplant physician for shipment of the CB unit.

E5.200 The CBB Director or designee shall review the record including processing, test results and medical history of each CB unit before its release.

E5.300 When the maternal medical and/or genetic screening history indicates potentially transmissible disease or when there is a positive or indeterminate infectious disease test result, the CBB Director or Medical Director shall authorize release of the non-conforming CB unit and document the rationale for such authorization.

E5.310 Units deemed non-conforming as a result of the risk for transmission of infectious disease by donor screening or testing shall bear a BIOHAZARD label.

E5.400 Documentation to accompany the CB unit shall include completed labeling and should include instructions for the handling and use of the unit including thawing and washing.

E5.500 At the time of issue for transplantation, a CB unit bearing a partial label shall be accompanied by the full information in Sections C5.330 and D5.000, attached securely to the CB unit on a tie tag or enclosed in a sealed package.

E5.600 The completed label shall include the following; Sections B7.200 and B7.300 apply.

E5.610 Name of the CBB.

E5.620 Type of processing.

E5.630 HLA phenotype and the techniques used for typing.

E5.640 Number of nucleated cells.

E5.650 Any deviations from compliance with these Standards.

E6.000 TRANSPORT OF CRYOPRESERVED UNITS FROM THE CORD BLOOD BANK TO THE TRANSPLANT FACILITY

E6.100 TRANSPORT WITHIN A FACILITY

Procedures for transferring cryopreserved CB units that are to be transported or used within the CBB facility shall be designed to protect the integrity of the CB unit and the health and safety of facility personnel.

E6.200 TRANSPORT BETWEEN FACILITIES

E6.210 Procedures for transport of cryopreserved CB units shall be designed to protect the integrity of the CB unit and the health and safety of personnel.

E6.220 The transit time between the CBB and remote facilities shall be minimized. There shall be plans for alternative transportation in an emergency.

E6.230 Cryopreserved units stored at a temperature below -135℃ shall be transported in a liquid nitrogen-cooled “dry shipper” that contains adequate absorbed liquid nitrogen and has been validated to maintain temperature at least 48 hours beyond the expected time of arrival at the receiving facility.

E6.231 The shipping methods shall conform to existing regulations regarding the mode of transport of such devices.

E6.232 The dry shipper shall be labeled in accordance with applicable regulations regarding the cryogenic material used and the transportation of biologic materials.

E6.233 The dry shipper shall contain a device that monitors temperature throughout the shipment period.

E6.2331 The device that monitors temperature shall be either an indicator showing that the temperature limit has not been exceeded or a continuous temperature recording device.

E6.240 The shipping container shall carry the following labels:

E6.241 “Cord Blood for Transplantation”, a label indicating that the shipment should not be exposed to radiation, and an appropriate biohazard label in compliance with regulations for the transport of human blood.

E6.242 The shipping container label shall also include the name, address and phone number of the shipping facility, the name, address, and phone number of the receiving facility; and the name of the person responsible for receipt of the shipment.

E6.250 Upon receipt, the receiving facility shall verify that the temperature has remained within specified limits during the shipment, shall document and provide this documentation to the CBB.

E6.300 Once an unrelated CB unit has left the CBB premises it shall not be returned to general CBB inventory.

E7.000 TRANSPORT RECORDS

E7.100 Transport records shall permit the tracing of the CB unit from the Collection Facility to its final destination.

E7.200 Transport records shall identify the facility responsible for shipping the CB unit, and the date and time of shipping and receipt of units.

E7.300 Transport records shall document the identity of the courier, if pertinent, the date and time of packaging; the date and time the package left the facility, and the date and time of receipt of the package.

E7.400 A shipping list identifying each unit enclosed in a package shall be included.

E7.500 Transport records shall be maintained indefinitely.

E8.000 CLINICAL OUTCOME DATA

E8.100 For every unrelated allogeneic, related allogeneic or autologous CB unit released, the CBB shall maintain details of clinical outcome as necessary to assure that the procedures in use in the CBB continuously provide a safe and effective component. Section B5.600 applies.

E8.110 For unrelated allogeneic, related allogeneic and autologous CB units, data shall include time to neutrophil and platelet engraftment.

E8.120 For unrelated allogeneic, related allogeneic and autologous CB units, data should include survival rates.

E8.130 For unrelated allogeneic and related allogeneic CB units only, data should include chimerism and GVHD results.

E8.140 For unrelated allogeneic, related allogeneic and autologous CB units, data should include an infectious disease.

E8.200 The CBB shall collect viability and cell yield results on the thawed CB unit.

E8.300 The CBB shall collect data on adverse events associated with infusion of the CB unit.

E8.400 The CBB should report their clinical outcome data to cooperating cord blood transplant registries such as AsiaCORD.