Directed/Related Cord Blood Collection by NHS Blood and Transplant

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Why collect cord blood?

- Blood left in the placenta & umbilical cord after the baby has been delivered
- Considered a waste bi-product
- Rich in haematopoietic stem cells with life saving potential for patients with leukaemia and other blood related malignancies.
- Alternative to bone marrow for a transplant, mainly used to treat children due to the small size of the donation and therefore cell numbers collected.
- Advantage is that matched stem cells from cord blood are immediately available
What is a Stem Cell?
Types of Cord Blood Banking

• Unrelated cord blood banking
  – Voluntary donations for altruistic use eg NHS CBB

• Directed/related cord blood banking
  – Collection for a specific recipient or potential recipient requiring a transplant

• Commercial/Private banking
  – Banking for private autologous use in the future
Network of NHSBT Laboratories involved with Cellular Therapies

Directed Cord Blood:
Oxford
Bristol
Birmingham
Leeds

Unrelated Banking:
NHS CBB – Moved from London to Bristol In 2009
The NHS CBB

- NHS Cord Blood Bank started in Feb 1996
- Unrelated banking
  - voluntary donations for patient used world-wide
- 3rd largest Single Public CBB in the world
- Nationally & Internationally accredited
- 20,000 donations banked. Aiming for 50,000 by 2022
- Currently 484 units have been issued to over 33 countries.
Directed cord blood collection

- Defined by the EBMT classification of transplant procedures  
  \textit{(BMT 37 2006 439)}

- Existing sibling suffers from malignant or non-malignant disorder requiring a transplant

- The collection is intended for future children of same parents at risk of a specific genetic disease

- Requests initiated by hospitals caring for existing/previous sibling and maternal consent obtained.
Quality Assurance

- Human Tissue Authority
- JACIE FACT-NETCORD accreditation
- Guidelines for Blood Transfusion Services in UK.
- NHS Blood & Transplant QA Dept.
HTA regulations from 5th July 2008

- Maternity units that collect cord blood need to act under an HTA procurement licence.

- Cord Blood must be traceable from collection to use.

- Collection staff should have training in collecting cord blood.

- Procedures should be in place to help avoid medical attention being drawn away from the mother and baby.

http://www.hta.gov.uk/licensingandinspections/sectorspecificinformation/tissueandcellsforpatienttreatment/cordbloodprocurementfaqs.cfm#one
RCM and RCOG Advice for CB collection

• Support CB collection for medical & research purposes

• Do not support commercial cord blood collection

• Support HTA licensing and regulation for collection and storage

• Collection must not interfere with health of mother & baby

• Collection should take place by a trained collector, after the placenta has been delivered, in an area away from the delivery room
Laboratory Aspects of DCB collection

- A referral is made to the NHSBT SCI Dept. by a transplant unit
- Maternal screening for mandatory markers by NHSBT
- Obstetrician’s consent is obtained
- SCI laboratory liaises with the Midwifery Department
- A kit is delivered by the NHSBT to the Midwifery Department
- Collection is made by Midwifery Department or private collectors
- SCI Receive & cryopreserve cells within 24 hours
- Obtain WBC, volume, CD34+ count, tissue typing, RBC group, bacteriology and virology results.
- Prepare reports and request confirmation of storage.
- Costs met by referring hospital
Cord Blood Collection.
The cord is cleaned with iodine and then blood is drained into a bag with anti-coagulant via a line and needle.
All cells are processed in a GMP clean room where filtered air and specialised clothing limit contamination.
DCB collections by NHSBT under the HTA

- The referring hospital and NHSBT both have a procurement license

- NHSBT has a Third Party Agreement with the Midwifery Dept or a private collection company eg Phlebotomy UK Ltd

- NHSBT is legally responsible for complying with the HTA

- SCI arranges training in consultation with the midwifery department or ensures the collection company staff are trained.

- Premises must be suitable for the purpose
Collection details

- Cells not usually excluded from storage or use until the blood has been processed and tissue typing completed
- 28% were shown to be a match for HLA A, B, Cw, DR and DQ.
- Contamination comparable to unrelated cord blood banks
- Mean volume and TNC counts comparable to unrelated banks
- Failed collection (2.9%) was mainly due to a damaged cord and/or placenta
<table>
<thead>
<tr>
<th></th>
<th>1995-2005 120 months</th>
<th>2005-2008 30 months</th>
<th>2009-2013 48 months</th>
<th>Transplants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number (636)</td>
<td>268 (42%)</td>
<td>144 (23%)</td>
<td>224 (35%)</td>
<td>14</td>
</tr>
<tr>
<td>Malignancies (e.g. ALL)</td>
<td>126 (51%)</td>
<td>53 (21%)</td>
<td>68 (28%)</td>
<td>1 (7%)</td>
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<tr>
<td>Non-Malignant 1 (e.g. b-Thal., SCD, DBA)</td>
<td>68 (35%)</td>
<td>47 (24%)</td>
<td>81 (41%)</td>
<td>8 (57%)</td>
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<tr>
<td>Non-Malignant 2 (e.g. SCID)</td>
<td>74 (38%)</td>
<td>44 (23%)</td>
<td>75 (39%)</td>
<td>5 (35%)</td>
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Thank You