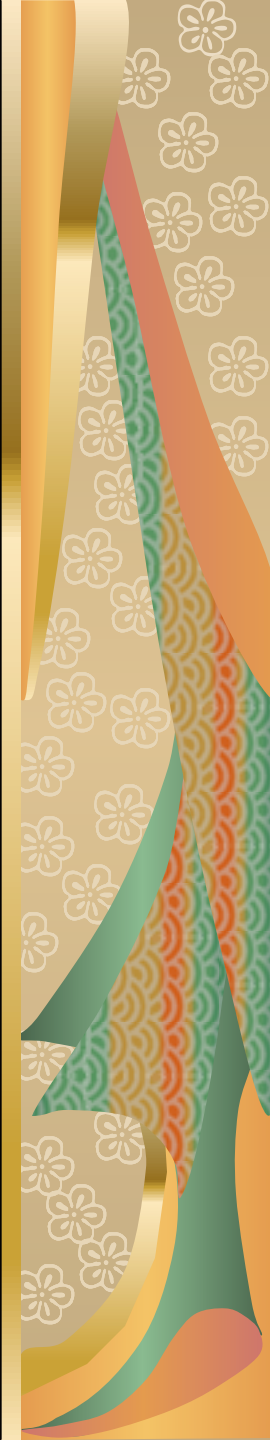


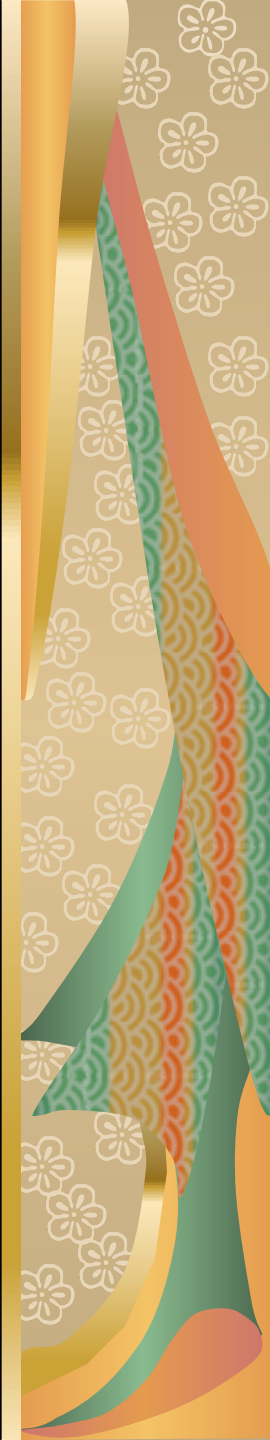
Umbilical cord blood collection, donation and banking in the UK

Laura Machin Ph.D.
Lecturer in Medical Ethics
Lancaster Medical School, UK



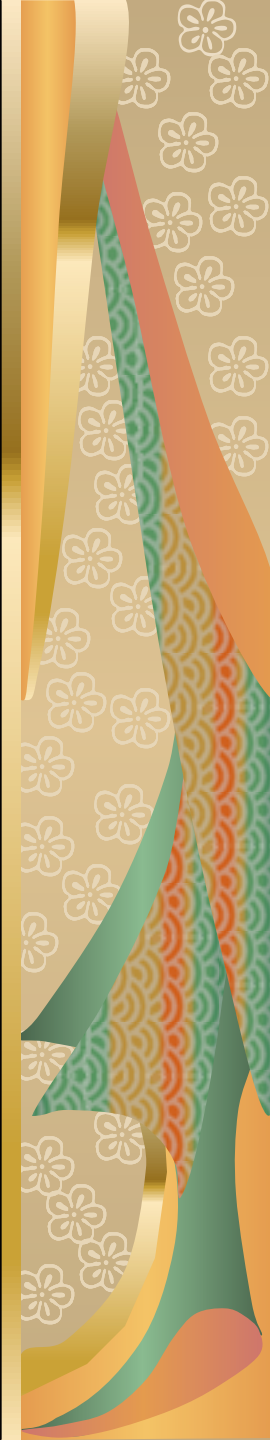
Understanding Cord Blood

- Cord blood is the blood found in the placenta and umbilical cord
- When a baby is born, and the placenta delivered, the cord blood can be collected
- Inside the blood are stem cells, which can be used in transplants instead of bone marrow
- To treat people with blood disorders
- Cord blood is 'Human Leukocyte Antigen-typed'



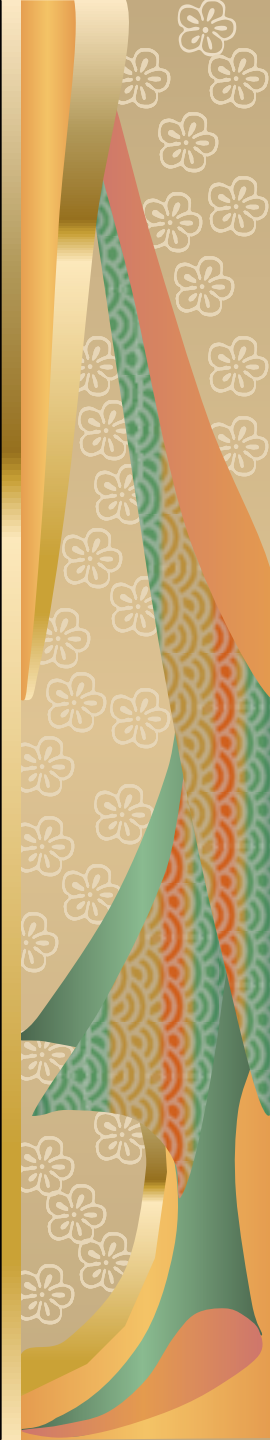
Understanding Cord Blood

- 'ready-to-use' and 'off-the-shelf'
- Less stringent matching = more units available to more people
- Better long term prognosis of recipient
- Easier to collect
- Enables access to racial and ethnic groups, which are thought to have increased propensity for specific blood disorders



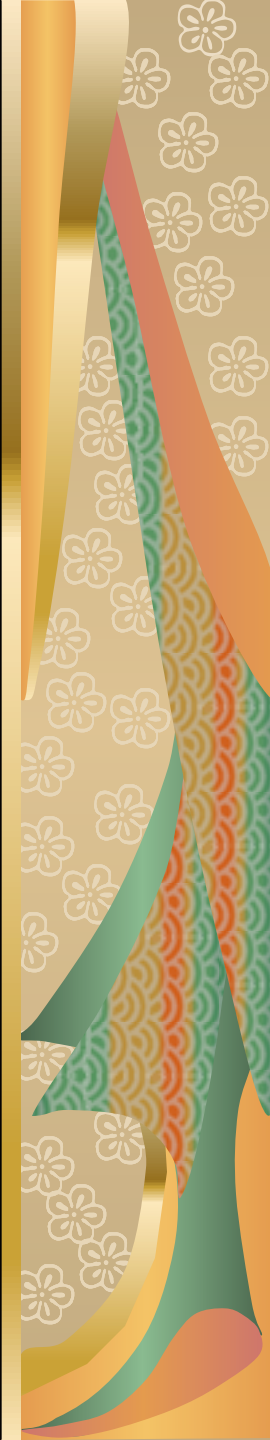
Global Context

- Over 400,000 cord blood units have been donated to the 128 public banks across the world since 1991
- Between 50,000 – 70,000 stem cell transplants have been conducted worldwide
 - Since 1988, more than 20,000 stem cell transplants using cord blood



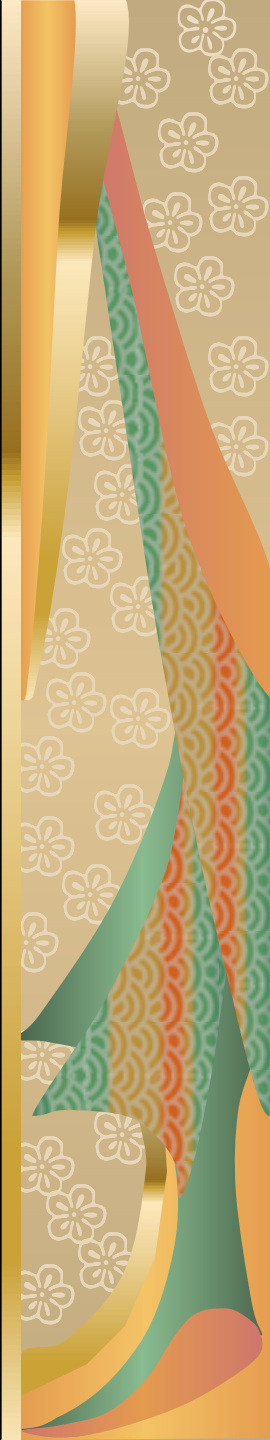
Global Context

- Largest banks are USA & Spain in terms of amount stored, collection, and transplants
- Cord blood units sourced through national and international registries
- Cost of cord blood unit £15,000 – £20,000
- International cord blood market worth over £20 million (WMDA, 2008)
- Standard setting agencies (JACIE, FACT, NETCORD)



The UK Context: Collection

- Not every pregnant woman made aware of cord blood collection
 - All Party Parliamentary Group established to increase awareness of cord blood banking
 - Umbilical Cord Blood (Donation) Bill
- Collection not available to every pregnant woman
 - Cord blood collected from only 6 hospitals
 - All collection from NHS hospitals based in South of England due to racial and ethnic diversity population
 - Only 4 hospitals collect every day, all day
 - APPG Report (2012) states aim for 13 collection sites across UK
 - 700,000 women given birth in the UK, research conducted by the Anthony Nolan Trust (2012) suggests that 85% of those women would be willing to donate



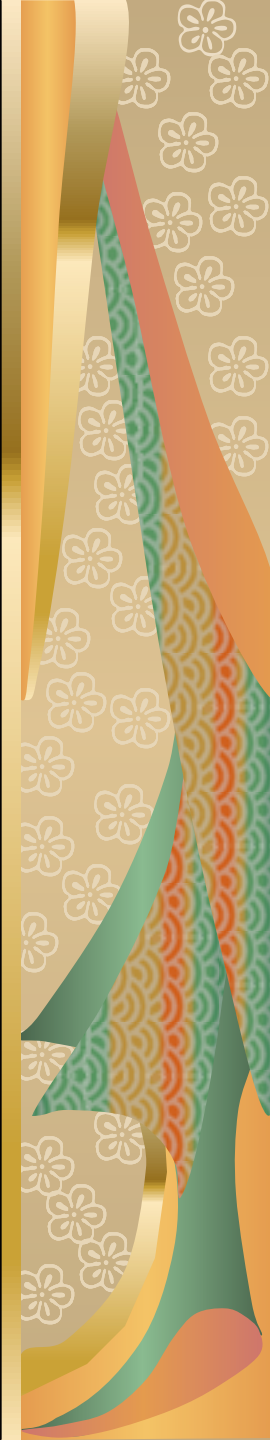
The UK Context: Collection

■ Collection by donor coordinators

- Women approached and consent gathered after 30th week of pregnancy
- APPG Report wishes to investigate standard training and education necessary for collectors

■ Ongoing debates

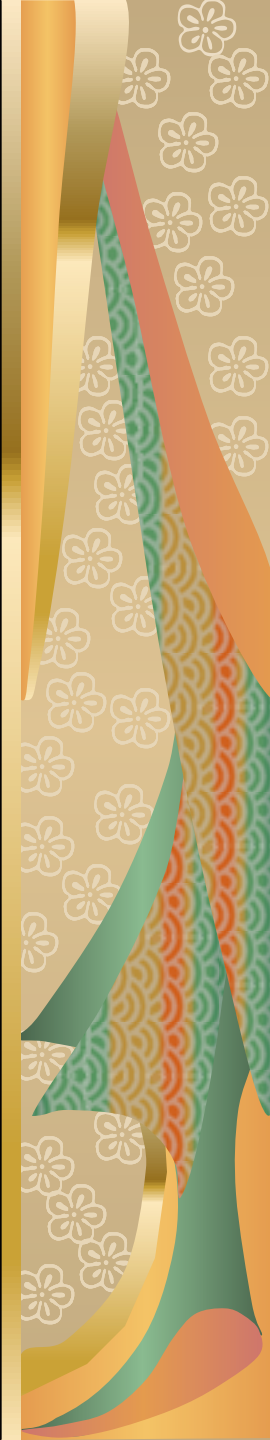
- Factors of a 'quality' collection?
- APPG's 'Best practice tariff'



The UK Context: Banking







■ Cord blood public banking

- England & Wales: 2 public banks - NHS & Anthony Nolan Trust (Scotland: 1 public bank, collect from Glasgow, since 2011 / Northern Ireland: 1 public bank)
- NHS bank has over 17,000 units stored
- ANT, Scotland and NI banks have combined inventory of over 1,000 units.
- UK Stem Cell Strategic Forum / APPG aim in crease cord blood banking over the next 8 years
 - 50,000 cord blood units
 - meet 85% of unmet transplant need = 200 lives a year
 - 30-50% of donations should be from racial and ethnic groups
 - Cord blood units should have 'high' TNC count
 - High resolution HLA typing performed on all new and selected existing cord blood units



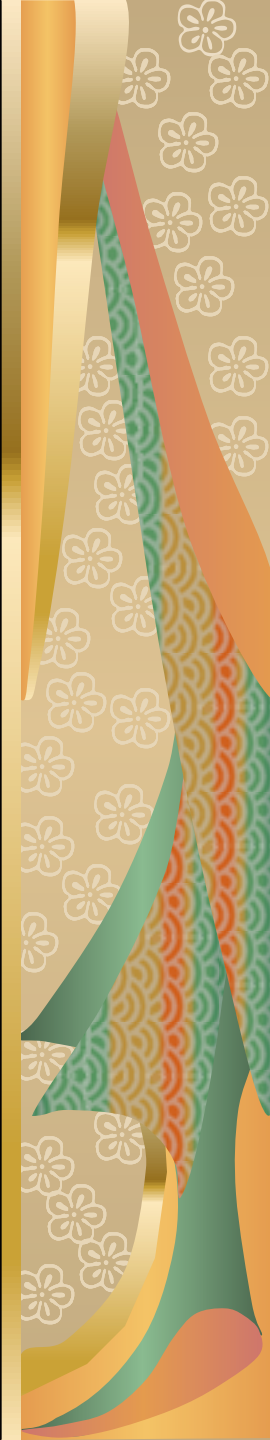
The UK Context: Banking

Cord blood commercial banking

-  4 dominant banks storing in UK
-  Costs approx £1,500 – 2,500 for 20 – 25 yr contract
-  Collection limited to hospitals with Human Tissue Authority 'Third Party Agreement'
-  Collection by phlebotomists
-  Different processing methods
-  Royal Colleges expressed concerns about commercial cord blood banking

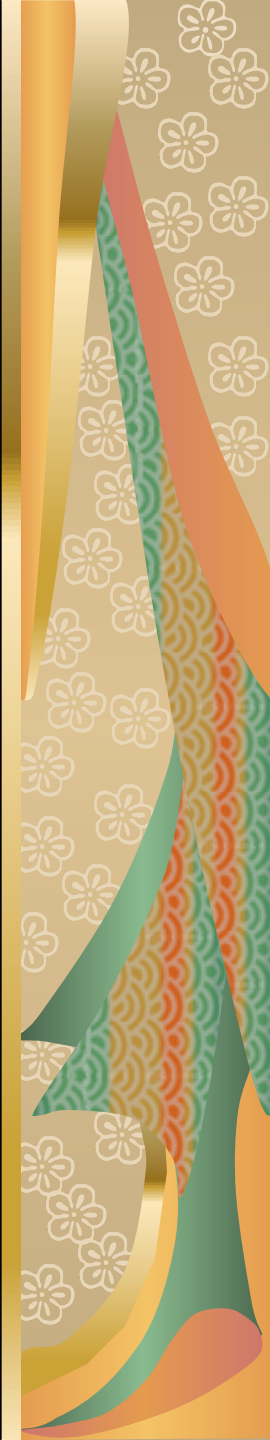
Ongoing debate

-  Public and private partnership for cord blood banking



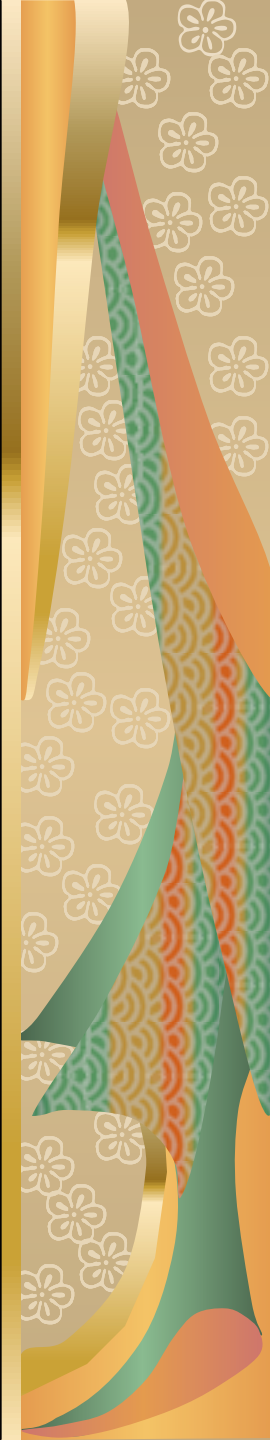
The UK Context: Transplant

- Cord blood transplants have only taken place in the UK since 1996
- BM still choice of stem cells in transplants
- UK Stem Cell Forum propose regional centres of excellence
- 'Transplant quality' in 2010
 - 3204 units collected
 - Approx 1400 'high dose' banked
 - 112 units used in transplants
- Cost-efficiency or profit-making?
 - Imported 80% of units used in transplants (2011 - 2012)
 - APPG proposing to reduce costs through domestic supply, recover costs through exports, recover costs through samples supplied for research



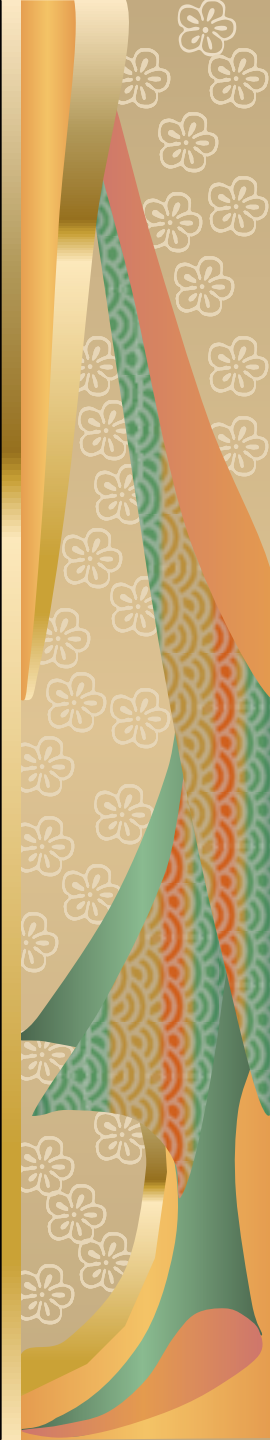
Cord Blood Transplants: Knowns

- Factors affecting the ‘quality’ of CB when used in trans:
 - Cell counts (TNC / CD34+ cell)
 - HLA (type / typing techniques)
 - Length of storage / Age of unit
 - Bank
 - Method of storage (red blood cells)
 - Accreditation
 - Methods of measuring cell counts
 - Red blood cells included in count?
 - Bag storage
 - Maternal and infant follow up testing
 - Clinical expertise



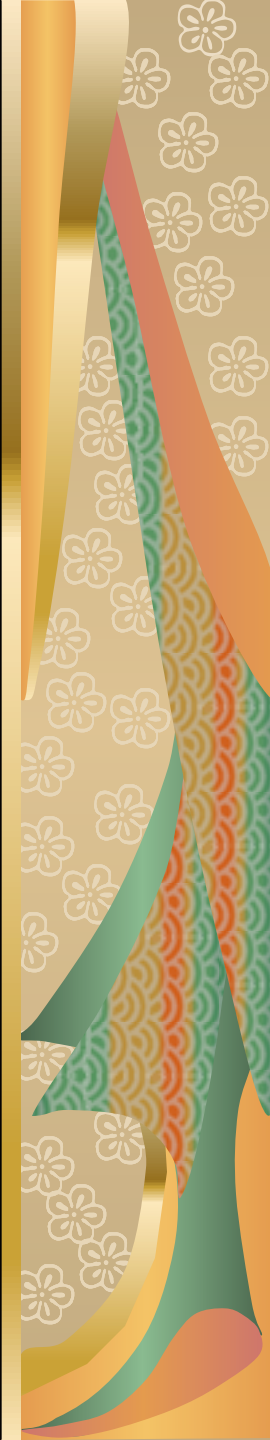
Cord Blood Transplants: Unknowns

- How do those in transplant centres decide when to use cord blood instead of bone marrow in transplants?
- How do those in transplant centres decide which banks to import a cord blood unit from?
- What makes a 'quality' cord blood unit for those working in transplant centres?
- Do those working in transplant centres deem the collection and banking processes as influencing the 'quality' of cord blood units?
- What policies and practices are considered by those working in transplant centres as facilitating a 'quality' cord blood collection?
- Do the notions of 'quality' in cord blood collection, banking and transplant differ across countries like Japan and the UK?



Potential Japan / UK Collaboration




- Limited understanding of Japanese cord blood collection, banking and transplant systems
 - Based on previous project and published material (in English)
 - Limited import and export of cord blood – suggests self-sufficiency in terms of banking and transplant system
 - 8 cord blood banks, red cross involvement, obstetricians collect cord blood
 - 1st bank opened 1999, now conducting more transplants compared to UK
 - Volunteers involved in cord blood collection and banking processes




Potential Japan / UK

Collaboration

Unique research:

-  Conducting qualitative study in the 'quality' of cord blood rather than simply clinical/scientific
-  Exploring the views and perceptions of those using cord blood, rather than solely those collecting
-  Consider all aspects of cord blood i.e. collection, banking and transplant, rather than in isolation

Cross-cultural comparison:

-  Gain insight into Japanese cord blood collection, banking and transplant processes and policies making contribution to policy developments in both countries

