Human Milk Banking

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Donor milk forms an integral and vital part of the early neonatal care of VLBW infants.
American Academy of Pediatrics policy recommendations on donor EBM*

• “The potent benefits of human milk are such that all preterm infants should receive human milk

• Mother’s own milk, fresh or frozen, should be the primary diet for preterm infants, and it should be fortified appropriately for the infant <1500g”

*Pediatr 2012;129:e827–41
American Academy of Pediatrics policy recommendations on donor EBM

“\textit{If mother’s own milk is unavailable despite significant lactation support, pasteurized donor milk should be used}”

“\textit{Quality control of pasteurized donor milk is important and should be monitored}”

*Pediatr 2012;129:e827–41*
Expressed breast milk (EBM) is used in three forms:

• Unpasteurized own mother’s EBM from HIV- women

• Pasteurized own mother’s EBM from HIV+ women

• Pasteurized donor EBM
Risk of necrotizing enterocolitis in preterm or low birth weight infants fed formula milk versus donor breast milk. (Reference # 14)

<table>
<thead>
<tr>
<th>Study Author, Year</th>
<th>Formula Milk</th>
<th>Donor Breastmilk</th>
<th>Weight</th>
<th>Risk Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross,\textsuperscript{47} 1983</td>
<td>3/26</td>
<td>1/41</td>
<td>8.1%</td>
<td>4.73 (0.52, 43.09)</td>
</tr>
<tr>
<td>Tyson et al,\textsuperscript{48} 1983</td>
<td>1/44</td>
<td>0/37</td>
<td>5.7%</td>
<td>2.53 (0.11, 60.39)</td>
</tr>
<tr>
<td>Lucas et al,\textsuperscript{49} 1984</td>
<td>4/76</td>
<td>1/83</td>
<td>10.0%</td>
<td>4.37 (0.50, 38.23)</td>
</tr>
<tr>
<td>Lucas et al,\textsuperscript{49} 1984</td>
<td>5/173</td>
<td>2/170</td>
<td>21.0%</td>
<td>2.46 (0.48, 12.49)</td>
</tr>
<tr>
<td>Schanler et al,\textsuperscript{18} 2005</td>
<td>10/88</td>
<td>5/78</td>
<td>55.3%</td>
<td>1.77 (0.63, 4.96)</td>
</tr>
<tr>
<td>Total</td>
<td>23/407</td>
<td>9/409</td>
<td>100%</td>
<td>2.46 (1.19, 5.08)</td>
</tr>
</tbody>
</table>
Aspects of breast milk banking

- Facilities
- Donors
- Legal aspects
- Process of Pasteurization
- Storing of pasteurized EBM
- Issuing pasteurized breast milk to the ward
- Nursing aspects
- Deficiencies of pasteurized donor milk
Facilities

- Commercial Pasteurization Unit e.g. Milk Matters at Mowbray

- Central milk kitchen of hospital e.g. pasteurization at Tygerberg for neonatal wards

- Milk kitchen in neonatal ward: a) Pasteurization of HIV+ EBM  
  b) Pasteurization of donor EBM at Level 1 & 2 hospitals
Breast milk donors

Lactating women who:

• have extra milk after feeding their own infant

• have experienced a peri-natal loss
Donor selection

Donors must:

• Be in good health

• Not be taking medications or herbals

• Be nursing an infant <1 year old
Milk Bank donor requirements

• Non-smoker

• Negative tests for viruses (prenatal results NOT used)

• No medications while donating except: vitamins, minerals, food supplements, progestin-only birth control, eltroxin, insulin
Donor requirements, contd

• No recent blood transfusion (12mth) or transplant (12mth)

• Limited use of caffeine and <2 X 30ml alcohol/day

• Will donate a minimum of 300ml
Excluded

• High-risk behavior for HIV
• Use of illegal drugs
• Tattoo or body piercing within the last 12 months
Donor screening

- Rigorous; involves verbal and written questionnaires

- Laboratory serologic blood testing for:
  - HIV 1 & 2
  - Hepatitis B virus
  - Hepatitis C virus
  - Syphilis
  - Tuberculosis: history
PANORAMA MEDI-CLINIC
NEONATAL UNIT
Donor Information and Screening Questionnaire

Name: 

Address: 

Contact nr:  E-mail address: 

Please note that the information contained in this form will be kept confidential.

<table>
<thead>
<tr>
<th>Question</th>
<th>Please Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you received a blood transfusion or blood products in the last 12 Months?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>2. Do you regularly have more than 50ml of hard liquor (i.e. whisky/ Brandy) or more than 2 glasses of wine or beer in a 24-hour period?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>3. Do you smoke?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>4. Do you drink more than 7 cups of coffee or caffeinated drinks (such as “Coca-Cola”) per day?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>5. Do you regularly use any medication such as radio-active drugs or chemotherapeutic agents, immune-suppressants, anti-depressant or anti-psychotic agents?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>6. Do you use habit-forming drugs such as cannabis (dagga), cocaine, Heroin or tik?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>7. Have you ever been treated for Tuberculosis (TB)?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>8. Do you have Hepatitis B?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>9. Do you have a copy of the results of your antenatal HIV test?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>10. If Yes to no. 9: Was the HIV test result negative or positive?</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>11. If you have not been tested for HIV in the last six months, would you be willing to be tested for HIV now?</td>
<td>Yes/ No</td>
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<tr>
<td>12. Would you inform the Breast Milk Bank immediately of any new medication you start using while you are donating breast milk?</td>
<td>Yes/ No</td>
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<tr>
<td>13. Would you inform the Breast Milk Bank immediately of any breast conditions such as mastitis and sore or cracked nipples?</td>
<td>Yes/ No</td>
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</tbody>
</table>

I hereby give Panorama Medi-Clinic permission to use my donated breast milk for sick and / or premature babies.
I am unaware of any reason why my donated breast milk should not be safe for use.

Name and Surname (Printed): 

Signature:  Date: 
Donor education

- Proper collection: instructions and specific protocols for expressing

- Storage (-20°C)

- Correct transport of milk is paramount
Mass pasteurization: two methods

• Heat processing with the Holder Method using a commercial pasteurizer (62.5°C for 30 minutes)

• High-temperature, short-time pasteurization method (72°C for 16 seconds)

• All milk banks perform post-pasteurization bacteriologic testing
Commercial Pasteurizers
Laboratory testing for bacterial contamination
Labelling of milk containers
Dedicated freezer facilities
Pasteurised milk in freezer
Refrigeration
Legal aspects
Milk bank file

- Donor mother’s screening questionnaire forms and lab results
- Name and hospital number of recipient baby
- Number assigned to donor mother
- Consent form for donor EBM of recipient baby’s parents
CONSENT FOR DONOR BREAST MILK ADMINISTRATION

I confirm that I have been fully informed and that my questions have been answered by Dr. ____________________ regarding the following:

- The process of human milk donation
- The pasteurization of human donor milk
- The possible risks involved with administration of human donor milk, and
- The procedure in place to limit such possible risks
  - I confirm that I will be liable for the costs of relevant blood tests on the human milk donor in order to ensure the safest possible supply of donor milk to my baby.
  - I understand that more than one donor may be required, and that I will be liable for all relevant costs.
  - I understand that the supply of human donor milk is dependant on the availability of human milk donor at any given time.
  - I therefore undertake to go to every effort to increase my own breast milk supply in order to provide a sufficient supply of breast milk to my baby at all times.
  - I understand and respect the right of the human milk donor to anonymity.
  - I confirm that I will supply a minimum of 25 glass containers for the collection and storage of pasteurized donor milk for my baby.
  - I, the undersigned, hereby consent to the administration of pasteurized human donor milk to ____________________ (full names of baby).

I hereby indemnify Panorama Medi-Clinic, the Neonatal ICU and the human milk donor from any implications or allegations that may be associated with the baby receiving human donor milk.

<table>
<thead>
<tr>
<th>Date: __________________________</th>
<th>Date: __________________________</th>
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</thead>
<tbody>
<tr>
<td>Full names: parent/guardian: ____________________</td>
<td>Telephonic consent: Yes/No</td>
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<tr>
<td>Signature: Parent: ____________________</td>
<td>Authorised person: ____________________</td>
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<td>Signature: Witness 1: ____________________</td>
<td>Signature: Witness 1: ____________________</td>
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<tr>
<td>Signature: Witness 2: ____________________</td>
<td>Signature: Witness 2: ____________________</td>
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</table>

RECEIPT OF GLASS CONTAINERS:
Before donor EBM is administered to a baby two nurses must check:

- baby’s name
- hospital number
- assigned number of donor
- date of collection on the container of milk
Before donor EBM is administered to a baby two nurses must:

• Complete the relevant nursing documentation in the infant’s folder

• Note the name of the nurse, signature, date and time that the milk was checked in the infant’s folder
<table>
<thead>
<tr>
<th>Issue Date and Time</th>
<th>Donor no.</th>
<th>Pasteurisation Date</th>
<th>Thawing Time</th>
<th>Issue Date and Time</th>
<th>Donor no.</th>
<th>Pasteurisation Date</th>
<th>Thawing Time</th>
</tr>
</thead>
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<tr>
<td>Day 3</td>
<td>? new</td>
<td>motivation</td>
<td>needed</td>
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<tr>
<td>Day 28</td>
<td>new</td>
<td>motivation</td>
<td>needed</td>
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</tbody>
</table>
Before donor EBM is administered to a baby **two nurses** must:

- sign the relevant nursing documentation in the infant’s folder

- the name of the nurse, signature, date, and time that the milk was checked must be noted in the infant’s folder.
Factors affecting the safety of donor milk

- Nature of donor screening
- Donor honesty (about unknown medications or herbal exposure)
- Potential infectious agents
- Milk changes due to storage and preservation
• Pasteurized donor milk must be used within 24 hours of thawing

• Pasteurized donor milk (without fortifiers or other additives) remains culture-negative for 24 hours after thawing and routine handling in the NICU
## Donor milk composition

### Reported donor human milk composition

<table>
<thead>
<tr>
<th>Macronutrients</th>
<th>Fat (g/dL)</th>
<th>Protein (g/dL)</th>
<th>Lactose (g/dL)</th>
<th>Calories (kcal/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm milk, Australia, PREM,</td>
<td>4.16 ± 0.9</td>
<td>1.35 ± 0.3</td>
<td>6.7 ± 0.6</td>
<td>69.7 ± 8.7</td>
</tr>
<tr>
<td>N = 47</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation (%)</td>
<td>21.5</td>
<td>24.5</td>
<td>8.9</td>
<td>—</td>
</tr>
<tr>
<td>Term milk, US, Prolacta, N = 273</td>
<td>3.22 ± 1.0</td>
<td>1.16 ± 0.25</td>
<td>7.8 ± 0.88</td>
<td>65 ± 11</td>
</tr>
</tbody>
</table>
Deficiencies of mature donor breast milk for VLBW infants*

• Low caloric content

• Low protein content

• Low calcium, phosphate & sodium content

• Reduced anti-infective properties

*Morales et al. Semin Perinatol. 2007 31:83-88
Consequences of feeding mature donor breast milk to a VLBW infant for a prolonged period*

- Poor weight gain
- Higher alkaline phosphatase and reduction in linear growth at 18 months (2cm)
- Hyponatraemia
- Lower phosphate & zinc levels

*Morales et al. Semin Perinatol. 2007 31:83-88
Correcting the deficiencies caused by feeding mature donor breast milk to VLBW infants*

- Add fortifier
- Monitor serum sodium levels
- Monitor weight gain (15g/kg/day)

* Morales et al. Semin Perinatol. 2007 31:83-88
Pasteurization of donor milk in a small hospital

Flash-heating method
1. Equipment: Stove or flame, pot(±1L), glass jar, weight to stop jar toppling over, feeding cup.

2. Wash hands well with soap and hot water and dry with clean towel.

3. Express 50 to 150ml breastmilk into sterile glass jar, cover jar.

4. Place pot with the jar of expressed breastmilk (EBM) on stove.

5. Place weight on jar of EBM to keep it stable.

6. Pour tap water into the pot to 2 fingers above level of EBM in jar.

7 a) Switch stove on high.
    b) Bring water in pot to rapid boil
    c) Switch stove off and........

8. Immediately remove;
    a) Weight from jar,
    b) Pot from stove and
    c) Jar of EBM from hot water.
Summary

• Milk banking is indispensable in the management of VLBW infants

• Comparative to the handling of blood for transfusions
The Human Milk Banking Association of South Africa

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