The OneMatch Stem Cell and Marrow Network

BDBMS Courier Training
November 7th, 2013
OneMatch

- A Canadian Blood Services program dedicated to recruiting and finding healthy, committed volunteer donors for Canadian and International patients in need of stem cell transplants.
- 10th largest registry in the world with over 300,000 donors.
- Established in 1988.
- Formerly known as the Unrelated Bone Marrow Donor Registry – UBMDR (re-branded in October 2007).
OneMatch Fast Facts – October 2013

• Searchable donors: 324,092
• Canadian Transplant Centres: 12
• Canadian Collection Centres: 8
• International Registries: 71
  – Over 21,804,092 registrants worldwide
• International Cord Blood Banks: 48
  – Over 590,426 umbilical cord blood units

Francis,
OneMatch Registrant
What Does OneMatch Do?

• Recruits and maintains volunteer donor information
• Searches for matched donors for patients
  • Ensures donors are healthy and able to donate
  • Coordinates the collection of stem cells in Canada and around the world
Stem Cell Transplants

Adults and children with life threatening diseases, such as:

– leukemia
– aplastic anemia
– immune dysfunctions
– genetic disorders

Danny, OneMatch Registrant
Why Unrelated Donors?

- HLA Typing: inherited genetic markers
- Only 25% of patients have a match in family
- Unrelated donors are often from the same ethnic group as the patient

Leila,
OneMatch Registrant & whole blood donor
How are stem cells collected?

- Marrow - surgical procedure in hospital
- Peripheral Blood - injections, then apheresis
  - Umbilical Cord blood is obtained at birth, stored and frozen in a “bank”
  - Donor’s marrow replaced in 4-6 weeks

Mike,
Stem cell & whole blood donor
How are stem cells given to the patient?

• The patient receives chemotherapy and/or radiation to destroy the diseased cells
• The donated cells are transfused directly into the blood stream
• The donor’s cells travel to the marrow and begin to function and multiply
Hematopoetic Stem Cells

- Hematopoetic stem cells are “not yet mature” (undifferentiated) cells that can divide and develop into any one of the three main types of cells found in the blood:
  - Red blood cells, which carry energy-giving oxygen from the lungs to the entire body;
  - White blood cells, important immune cells that play an important role in fighting bacteria and viruses that cause infection; and
  - Platelets, which help blood to clot when bleeding occurs.
Diseases treated with stem cell transplants

- Acute Myelogenous Leukemia
- Chronic Myelogenous Leukemia
- Hodgkin's Lymphoma
- Other Malignancy
- Hurler Syndrome
- Wiskott Aldrich Syndrome
- Other Non-Malignant Disease
- Combined Immunodeficiency
- Refractory Anemia
- Waldenstrom's Macroglobulinemia
- Myeloproliferative Disease
- Proxysmal Nocturnal Hemoglobinuria
- Congenital Erythropoietic Porphyria
- Severe Combined Immunologic Disease
- Familial Erythrophagocytic Lymphohistiocytosis

- Acute Lymphoblastic Leukemia
- Chronic Lymphocytic Leukemia
- Non-Hodgkin's Lymphoma
- Severe Aplastic Anemia
- Hunter Syndrome
- Adrenoleukodystrophy
- Histiocytosis-X
- Promyelocytic Leukemia
- Chronic Granulocytic Leukemia
- Osteopetrosis
- Sickle Cell Anemia

- Other Leukemia
- Myelodysplasia
- Multiple Myeloma
- Fanconi's Anemia
- San Filippo
- Thalassemia
- Gauchers
- Purtilo
- Myelofibrosis
- Juvenile CML
How are donors and patients matched?

- Stem cell matches are determined according to DNA markers on white blood cells called Human Leukocyte Antigens (HLA).

- A buccal (cheek) swab sample is collected and tested for six of these antigens (HLA-A, HLA-B and HLA-DRB1).
How do you become a donor?

• You must be between ages 17-35
• Must be healthy, and committed to all patients
• Register at www.onematch.ca
• Buccal Swab collection at enrolment
• You’re registered until 60th birthday
• Confirmatory Testing: potential match
• Workup: you’re the “one match” to save a life
Diagram of HLA Inheritance

Mother’s HLA Typing
A*32:01, B*27:05, C*01:02
DRB1*13:01, DQB1*06:03

Father’s HLA Typing
A*24:02, B*08:01, C*07:01
DRB1*03:01, DQB1*02:01
A*02:01, B*44:02, C*05:01
DRB1*15:01, DQB1*06:02

Child 1
A*32:01, B*27:05, C*01:02
DRB1*13:01, DQB1*06:03
A*24:02, B*08:01, C*07:01
DRB1*03:01, DQB1*02:01

Child 2
A*03:01, B*35:01, C*04:01
DRB1*14:54, DQB1*05:03
A*24:02, B*08:01, C*07:01
DRB1*03:01, DQB1*02:01

Child 3
A*32:01, B*27:05, C*01:02
DRB1*13:01, DQB1*06:03
A*02:01, B*44:02, C*05:01
DRB1*15:01, DQB1*06:02

Child 4
A*03:01, B*35:01, C*04:01
DRB1*14:54, DQB1*05:03
A*02:01, B*44:02, C*05:01
DRB1*15:01, DQB1*06:02
Three Matching Scenarios

• Canadian Donor for Canadian Patient

• Canadian Donor for International Patient

• International Donor for Canadian Patient
Performance
Canadian Patient Searches

Number of Patients

- 2008/2009: 541
- 2009/2010: 624
- 2010/2011: 716
- 2011/2012: 770
- 2012/2013: 745
- 2013/2014 YTD: 741

Total
Products Collected from Canadian Donors
-Marrow, PBSC, DLI-

- Fiscal Year
  - Canadian Patient
  - International & Hema-Quebec Patient

Number of Products

- 2008/2009: 34 (Canadian Patient) 44 (International & Hema-Quebec Patient)
- 2009/2010: 46 (Canadian Patient) 45 (International & Hema-Quebec Patient)
- 2010/2011: 43 (Canadian Patient) 53 (International & Hema-Quebec Patient)
- 2011/2012: 50 (Canadian Patient) 57 (International & Hema-Quebec Patient)
- 2012/2013: 46 (Canadian Patient) 57 (International & Hema-Quebec Patient)
- 2013/2014 YTD: 26 (Canadian Patient) 45 (International & Hema-Quebec Patient)
Canadian Unrelated Transplants
-Bone Marrow & PBSC-

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Canadian Donor</th>
<th>International &amp; Hema-Quebec Donor</th>
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</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>33</td>
<td>150</td>
</tr>
<tr>
<td>2009/2010</td>
<td>44</td>
<td>153</td>
</tr>
<tr>
<td>2010/2011</td>
<td>42</td>
<td>167</td>
</tr>
<tr>
<td>2011/2012</td>
<td>43</td>
<td>230</td>
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<td>2012/2013</td>
<td>47</td>
<td>240</td>
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<tr>
<td>2013/2014 YTD</td>
<td>26</td>
<td>124</td>
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Cord Units Procured for Canadian Patients

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<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of Cord Units Procured</th>
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<tbody>
<tr>
<td>2008/2009</td>
<td>54</td>
</tr>
<tr>
<td>2009/2010</td>
<td>50</td>
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<tr>
<td>2010/2011</td>
<td>23</td>
</tr>
<tr>
<td>2011/2012</td>
<td>52</td>
</tr>
<tr>
<td>2012/2013</td>
<td>48</td>
</tr>
<tr>
<td>2013/2014 YTD</td>
<td>14</td>
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</tbody>
</table>

International Cords
Where Canadian donations go

Destination of Product

<table>
<thead>
<tr>
<th>Percentage of Total Products</th>
<th>United States</th>
<th>Germany</th>
<th>Italy</th>
<th>United Kingdom</th>
<th>France</th>
<th>Australia</th>
<th>Netherlands</th>
<th>Spain</th>
<th>Sweden</th>
<th>Argentina</th>
<th>Other</th>
</tr>
</thead>
</table>
Where International products come from
RECRUITMENT EFFORTS
<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of Registrants</th>
</tr>
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<tbody>
<tr>
<td>2003/2004</td>
<td>4,264</td>
</tr>
<tr>
<td>2005/2006</td>
<td>4,450</td>
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<tr>
<td>2007/2008</td>
<td>7,093</td>
</tr>
<tr>
<td>2008/2009</td>
<td>8,428</td>
</tr>
<tr>
<td>2009/2010</td>
<td>10,602</td>
</tr>
<tr>
<td>2010/2011</td>
<td>19,697</td>
</tr>
<tr>
<td>2011/2012</td>
<td>17,229</td>
</tr>
<tr>
<td>2012/2013</td>
<td>22,899</td>
</tr>
<tr>
<td>2013/2014 YTD</td>
<td>42,506</td>
</tr>
</tbody>
</table>

Legend:
- **Red**: Total New Registrants
- **Blue**: New Registrants <36
- **Green**: New Ethnic Registrants
Number and Proportion of Foreign-born in Canada, by Census Year

- 2011 Canadian Census

Number and Proportion of Foreign-born in Canada, by Census Year
Concentration of Immigrant Populations

- Kingston
- Barrie
- Kelowna
- Oshawa
- Winnipeg
- Ottawa - Gatineau
- St. Catharines - Niagara
- Edmonton
- Victoria
- London
- Canada (highlighted)
- Guelph
- Montreal
- Kitchener
- Windsor
- Calgary
- Abbotsford
- Hamilton
- Vancouver
- Toronto

The graph shows the concentration of immigrant populations across various cities in Canada, with each city representing its percentage of immigrant population. The bar for Canada is significantly higher than the others, indicating a higher concentration of immigrants at the national level compared to individual cities.
Ethnic Composition of OneMatch Database

- Caucasian, 71.6%
- Asian, 2.1%
- East Indian, 1.3%
- Chinese, 7.4%
- Filipino, 0.5%
- Japanese, 0.1%
- Korean, 0.2%
- Arab/West Asian, 0.9%
- Southeast Asian, 0.9%
- Latin American, 0.6%
- Multi-ethnic, 1.3%
- South Asian, 3.4%
- Hispanic, 0.2%
- Aboriginal, 1.0%
- Other, 4.4%
- Unknown, 2.9%
OneMatch Process: A Closer Look
What does OneMatch actually do? A closer look…

• Recruitment
• Registration
• Initial HLA Typing
• Search
• Extended HLA Typing / Confirmatory Typing
• Workup (donation)
• Post-donation
Donor Matching Process

1. Patient needs transplant
2. Recruitment
   - Successful
3. Registration
   - Registrant eligible
4. HLA Typing
   - Sit on Registry
5. Search
6. Workup
   - Potential donor identified
7. Extended HLA Typing / Confirmatory Typing
8. Best match identified
9. Post-Donation Follow-up

Successful
Workup Process

Case Manager’s role and responsibilities

• Management of the workup process of Canadian/international donors and cord procurement.
• Provide courier instructions to the TC
• Provide donor medical clearance
• Primary contact between the TC and CC/DC coordinators.
Workup Process
International Donor

• Liaise with the TC and International Registry to ensure effective communication throughout the workup process.

• Ensure that information provided to the TC and International Registry is clear and concise.

• Ensure that timelines are respected.
Workup Process
Canadian Donors

– Perform Donor Health Assessment Screening
– Information session
– Coordinate donor physical exam/blood work
– Travel / accommodation if required
– Follow-up post-donation until donor is fully recovered
– Liaise with the Canadian collection center, the donor and/or the transplant center or International Registry to ensure timeline are met.
HPC PRODUCT TRANSPORT
Over 45% of the HPC collected from unrelated donors are transported across international borders.

Guidelines for couriers and the transportation of haematopoietic progenitor cells (HPC-BM, apheresis and therapeutic cell-Tcells); WMDA, 2011
OneMatch Responsibilities For Product Transport

• Adheres to WMDA Standards and Guidelines for Courier and Transportation of Stem Cells
• Provide support/assistance to TC’s if any problems encountered by the courier during pick-up and/or transport of the product
• Provide documentation for customs clearance
Transplant Centre’s Responsibilities For Product Transport

- Designate suitable courier
- Provide and document training of courier
- Ensure designate courier can be reached at all time while away for a pickup
- Maintain policies and procedure for all aspects related to the product transportation, shipping and receipt of the product in accordance with applicable regulations and standards, and based, at a minimum, upon the guidelines outlined in OneMatch’s TC Reference Manual - Section 11: “Product Transport”
- Notify Air Canada Meda-Desk
Courier’s Responsibilities

The courier is responsible for ensuring that HPC is transported safely from the collection centre to the transplant centre in the shortest possible time and at a temperature requested by the transplant centre. *Guidelines for couriers and the transportation of haematopoietic progenitor cells (HPC-BM, apheresis and therapeutic cell-Tcells);* WMDA, 2011
Courier Requisites

• Not be related to the donor or patient
• Be an experienced independent international traveller
• Have no other obligations until after HPC have been delivered
• Have access to a credit card with a reasonable limit
Courier Requisites

- Be trained in all P&P required for the transportation of HPC
- Must have adequate command of the English language or the language(s) used in the countries to be visited for International transport
Courier Responsibilities

• Remain in possession of the HPC product at all times
• Carry documentation relating to transportation of the HPC product
• Verify accuracy of information on HPC labels
• Place the product bags and samples, as instructed by the TC, in the cooler
Courier Responsibilities

• Ensure that the HPC does not pass through X-ray screening at security checkpoints
• Deliver the HPC directly to the designated person at the TC
• Inform the TC of possible delays
• Not consume alcohol or sedative while transporting the HPC
• Always maintain patient and donor confidentiality
Confidentiality

• If courier is known to family to the patient/patient’s family (e.g. courier is a TC coordinator), the patient/patient’s family should not be aware the person is serving as the courier.

• No personal contact with the donor, recipient or donor’s relative or friend
Confidentiality

• Must not be identified to any personnel who are not directly involved with the collection and/or transport of donor cells
• No disclosure to the recipient’s family or staff of the TC or CC, details that could results in identification or location of the donor recipient
Exportation Requirements for Germany

• Proforma invoice
• Export Accompanying Document
• Report to “Tax/Customs Office” in German Airport prior to departure
Contact Information for Courier

- Case manager and TC’s on call physician name and telephone numbers are provided on the courier’s letter.
- OneMatch Emergency numbers: 613-780-3328/cell: 613-296-6147
- DC/CC contact information is provided on courier’s instructions.
Airport Notifications

Some airports require notification of stem cell transportation:

- **Canada:** Toronto (Pearson), Montreal (PE Trudeau), Ottawa (MacDonald Cartier), Halifax (R.L. Stanfield), Calgary Intl and Vancouver Intl; please report to the Special Services counter when clearing with the Canadian Border Service Agency (CBSA).

- **International:** Paris (CDG) and London (Heathrow).
Examples of Courier’s Issues

- Problem with reaching contact person at DC/CC.
- Wrong product given to courier
- Discrepancies between the product transport instructions on the prescription and instructions provided to the courier
- Last minute flight changes - OneMatch needs to be notified as we may need to fax/refax the Airport Notification letter
- Mislabeling
- Unable to reach courier
Recommendations

• Product should not be allowed to pass through X-ray equipment however the empty container would not be of concern.

• Have or be provided by the TC with a mobile/cell phone: phone must have international roaming capability/connectivity for international HSC transport.
Questions?

Thank you!

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