Donation & Transplantation at Canadian Blood Services

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Donation & Transplantation
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Disclosure

• I have no involvement with the industry and therefore I have nothing to disclose nor can I identify any potential conflicts of interest.
Agenda

1. Overview of Canadian Blood Services
2. Donation & Transplantation
   a) Organ Donation & Transplantation
   b) OneMatch Stem Cell & Marrow Network
4. Questions
## Programs and services

<table>
<thead>
<tr>
<th>Programs and services</th>
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<tbody>
<tr>
<td>Red blood cells, platelets, plasma, stem cells</td>
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<tr>
<td>Stem cell and organ registries</td>
</tr>
<tr>
<td>Medical services</td>
</tr>
<tr>
<td>Knowledge, tools and expertise</td>
</tr>
<tr>
<td>Bulk purchasing and distribution of pharmaceutical plasma protein products</td>
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<td>Insurance captives: $1 billion comprehensive coverage</td>
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About Canadian Blood Services

Our business by the numbers

<table>
<thead>
<tr>
<th>Operations</th>
<th>People</th>
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<tbody>
<tr>
<td>Budget: ~$1B</td>
<td>~3,700 employees</td>
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<tr>
<td>41 static collection sites</td>
<td>17,000 volunteers</td>
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<tr>
<td>6,500 mobile collection sessions</td>
<td>412,000 blood donors</td>
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<tr>
<td>2 testing/ 8 processing sites</td>
<td></td>
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<tr>
<td>~700 hospitals served</td>
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</table>
What we do: The heart of our strategy

Manufacturing biological products
Including red blood cells, platelets, plasma, stem cells

Providing clinical services
Including registries, medical services, knowledge, tools, expertise

SUPPLY CHAIN MANAGEMENT
Planning, collection, manufacturing, testing and distribution of biologics products – to the right place at the right time.

CLINICAL AND MEDICAL SERVICES
From registry management to diagnostic services to hospital relationships.

RECRUITMENT
Identifying and attracting potential donors for all products and services, from blood to stem cells to organs.

INNOVATION
Research, knowledge creation/exchange, education and new product development.
Organ and Tissue Donation & Transplantation
Organ and Tissue Donation & Transplantation Programs and Services in CBS

Areas of Focus

- Develop leading practices & provide awareness & education services
- Timely & accurate data for reporting & system improvement
- Leading Practices, Professional & Public Education
- Strategic Plan Development & Implementation
- Clinical Governance, and Policy
- System Performance Improvement: Data, Analytics
- Canadian Transplant Registry
- Patient Programs & Services
- Clinical Governance Quality Management System to guide national programs and services
- Integrated Planning
- KPD Program
- HSP Program
- NOW Program
- CTR Services
- OM Program
- SCNSS Services
Call to Action

A strategic plan to improve organ and tissue donation and transplantation performance for Canadians.
Call to Action Recommendations

**IMPROVE ACCOUNTABILITY**
- Formal Accountability Framework
- ODT Committees
- Mandatory Data Reporting
- Auditing
- Donation Physicians

**INCREASE DONATION**
- National Public Awareness Strategy
- Intent-to-Donate Registries

**IMPROVE ACCESS TO TRANSPLANTATION**
- Comprehensive, Integrated, Inter-Provincial Patient Registries

**INCREASE COLLABORATION**
- Leading Practices
- Research and Innovation

**IMPROVE INFRASTRUCTURE AND CAPABILITIES**
- Data Management and Analytics
- Professional Awareness and Education
- Financial Resources for Frontline ODT Service Providers
Advancing the System Network with Collaboration

“Interim” Governance
OTDT Areas of Focus

Develop leading practices & provide awareness & education services

Leading Practices, Professional & Public Education

System Performance Improvement

Canadian Transplant Registry Programs & Services

Strategic Plan Development & Implementation

Policies review & feedback to guide national programs and services

KPD Program
HSP Program
NOW Program
CTR Services

Timely & accurate data for reporting & system improvement
# Canadian Transplant Registry

## Clinical Programs

<table>
<thead>
<tr>
<th><strong>KPD</strong></th>
<th>Enables matches among multiple donor-recipient pairs and anonymous non-paired donors, expanding the transplant possibilities for prospective kidney recipients who have willing but incompatible donors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increases the number of transplants and number of low risk transplants</td>
<td></td>
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<tr>
<td>• Creates a societal benefit from cost avoidance</td>
<td></td>
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<tr>
<td>• Removes patients from provincial waitlist</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>HSP</strong></th>
<th>Program for highly sensitized patients; opens up a national pool of donors for the hard-to-match</th>
</tr>
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<tbody>
<tr>
<td>• Increases equity of access to transplants</td>
<td></td>
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<tr>
<td>• Increases overall life-span of the transplant due to the low rejection rates</td>
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</table>

<table>
<thead>
<tr>
<th><strong>NOW</strong></th>
<th>Real-time listing data source, replacing the antiquated paper-based waitlist, for all non-renal patients throughout Canada</th>
</tr>
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<tbody>
<tr>
<td>• Makes it possible to obtain a true national picture of current wait times and access to organs for transplantation</td>
<td></td>
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</table>
Kidney Paired Donation (KPD) Program Performance
KPD Program Performance

Activity to Date

Match Cycles Executed 22 (June 2015)
Pairs Registered 763 (184 in last MC)
    Recipients Registered 707 (162 in last MC)
NDADs Registered 91 (8 in last MC)

Match Cycles Completed 21

Transplants Completed 361
    Registered Recipient Transplants 295
    Wait List Transplants 66

Next Match Cycle: October 2015
Highly Sensitized Program (HSP) Performance
Transplant for cPRA

959 HSP Registered
148 HSP Transplanted

% is the proportion of those registered with the specified cPRA whom received transplants through HSP
National Organ Waitlist (NOW)  
Performance
NOW & HSP Kidney Candidates

Organ Demand from Active Candidates

There are also 492 HSP Kidney Candidates, four of whom are also awaiting pancreas transplants.

These four candidates are included in the “Multiple” category above; however, candidates who were identified as requiring a kidney without being in the HSP category (cPRA >=95) for that organ are represented as single-organ candidates.
OTDT Areas of Focus

Develop leading practices & provide awareness & education services

Leading Practices, Professional & Public Education

Strategic Plan Development & Implementation

System Performance Improvement

Canadian Transplant Registry Programs & Services

Timely & accurate data for reporting & system improvement

Policies review & feedback to guide national programs and services

KPD Program
HSP Program
NOW Program
CTR Services
Leading Practices Timeline

Severe Brain Injury to Neurological Determination of Death (NDD). 2003

Medical Management to Optimize Donor Organ Potential. 2004

Assessment and Management of Immunologic Risk in Transplantation. 2005

Donation after Cardiocirculatory Death (DCD). 2005

Enhancing Living Donation. 2006

Kidney Allocation in Canada: A Canadian Forum. 2007

Brain Blood Flow in the Neurological Determination of Death. 2007


Kidney Paired Donation Protocol for Participating Donors. 2015

Bioburden Reduction and Control Leading Practices. 2015

Kidney Paired Donation Protocol for Participating Donors. 2015


Leading Practices for the Allocation of Organs for Combined Transplantation. 2015

Canadian Highly Sensitized Patient and Living Donor Paired Exchange Registries. 2005

Canadian Blood Services

it's in you to give
KPD Donation Protocol and Knowledge Translation
Engaging Medical Examiners and Coroners

- Collaborating with the Canadian Conference of Chief Coroners and Chief Medical Examiners to develop a Canadian Reference Donation Manual for coroners, medical examiners and pathologists
On-Line Donation Course for:

- Medical Examiners and Coroners
- Pathologists and Death Investigators
- Funeral Professionals
- Donation Organizations
- Eye and Tissue Banks

Canadian Blood Services will be launching this course in April 2015. With completion of the course participants will receive documentation to support submission for CEU’s.
## Public Education Materials

<table>
<thead>
<tr>
<th>Online Advertising Campaigns</th>
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<tbody>
<tr>
<td>Kidney Donor and Recipient Posters</td>
</tr>
<tr>
<td>Infographic</td>
</tr>
<tr>
<td>Doodle Video</td>
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<tr>
<td>“Think, Act, Talk” sell sheet</td>
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<tr>
<td>“Think, Act, Talk” public presentation</td>
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<tr>
<td>NWT Donor Family Video</td>
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Public Education & Awareness

Public Education Materials In Development
30 Second Versions

**Audio:**
Did you know that one organ donor can save up to 6 lives?

**Visual:**
- Open on text on screen: a hand (point as the number one) pokes upward.
- Organ donor
- The camera moves revealing a hand catching a heart as the words form around it.
- The heart falls downward and a string forms below it. The camera follows it down revealing...
- Seven other hands appear around the main hand.
- The heart
- Super Uncle Joe a second chance
- Your lungs could give Super Uncle Joe a second chance.
- Your heart and red ribbon
- A loving father because he has your liver.
- A little girl holding the balloon - she blinks.
- The camera moves and we see a dad and boy fishing. The fan text flaps.
- The camera moves and we see a man in a cape - his cape flaps in the wind.
- And your kidneys? It could help a Grandma master Zumba.
- The camera moves and reveals a grandma working out; she has one arm up and a second comes up.
- You’re not just donating your organs.
- You’re giving life.
- The camera moves and a hand with a heart comes in from the left.
- You have the power to give life.
- Register to become an organ donor.

**Canadian Blood Services**
it's in you to give
About OneMatch

• Only 25% of patients will find a related donor

• Established in 1988 (formerly known as the Unrelated Bone Marrow donor Registry UBMDR)

• Canadian Blood Services Program dedicated to recruiting and finding healthy, committed volunteer donors for Canadian and International patients in need of hematopoetic stem cell (HSC) transplants

• Re-branded in October 2007

• 10th largest registry in the world
Areas of Focus - OneMatch

- Search
- Donor Activations
- Workup
- Post-Donation
- Post-Transplant
Just over 360,000 searchable donors willing to give their stem cells to any patient in need anywhere in the world
26 million donors in global database

- OneMatch linked internationally to 75 registries in 53 countries
677,802 cord blood units

- International Cord Banks: 53 in 36 countries
Canadian Patient Searches

Program Performance

Canadian Blood Services
Société canadienne du sang
Program Performance

Products Collected from OneMatch Donors
- Marrow, PBSC, DLI -

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Canadian Patient</th>
<th>International/Hema-Quebec Patient</th>
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<tbody>
<tr>
<td>2008/2009</td>
<td>34</td>
<td>44</td>
</tr>
<tr>
<td>2009/2010</td>
<td>46</td>
<td>45</td>
</tr>
<tr>
<td>2010/2011</td>
<td>43</td>
<td>53</td>
</tr>
<tr>
<td>2011/2012</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>2012/2013</td>
<td>46</td>
<td>57</td>
</tr>
<tr>
<td>2013/2014</td>
<td>51</td>
<td>69</td>
</tr>
<tr>
<td>2014/2015</td>
<td>54</td>
<td>62</td>
</tr>
<tr>
<td>2015/2016 (YTD)</td>
<td>19</td>
<td>38</td>
</tr>
</tbody>
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Program Performance

Canadian Unrelated Transplants
-Bone Marrow & PBSC-

does not include Transplants for Quebec Patients

![Bar chart showing the number of transplants from 2008/2009 to 2015/2016 (YTD). The chart indicates the number of Canadian Donor and International/Hema-Quebec Donor transplants for each fiscal year.](chart.png)

- Canadian Donor
- International/Hema-Quebec Donor
Cord Units Procured for Canadian Patients

does not include procurement for Quebec Patients
Where Canadian donations go

- USA: 27%
- Germany: 14%
- Spain: 10%
- Canada: 10%
- Italy: 8%
- France: 6%
- Australia: 6%
- United Kingdom: 5%
- Netherlands: 3%
- Turkey: 2%
- Switzerland: 2%
- Finland: 1%
- Poland: 1%
- Slovenia: 1%
- Hungary: 1%
- Ireland: 1%
Where International products come from

- Germany: 51%
- United States: 29%
- Canada (Quebec): 11%
- United Kingdom: 4%
- Poland: 2%
- Australia: 1%
- China: 1%
- Portugal: 1%
- Finland: 1%
- Spain: 0%
- Italy: 0%
- Switzerland: 0%
- Taiwan: 0%
- Argentina: 0%
- Brazil: 0%
Program Performance

Ethnic Composition of OneMatch Database

- Caucasian: 70%
- Chinese: 7%
- Other: 6%
- Jewish: 0%
- Arab: 1%
- Black - African: 0%
- Black - Caribbean: 0%
- Black - Other: 1%
- Black - Ashkenazi: 0%
- Black - Sephardic: 1%
- Central Asian: 0%
- Filipino: 1%
- Inuit: 0%
- Jewish - Sephardic: 0%
- Israeli: 0%
- Jewish - Ashkenazi: 0%
- Jewish: 0%
- Jewish: 1%
- South Asian: 5%
- Southeast Asian: 0%
- South Jewish-Sephardic: 0%
- Northeast Asian: 0%
- Multiple Ethnicity: 2%
- North Asian: 0%
- Mexican: 0%
- Métis: 0%
- Other: 6%
- Pacific Islander: 0%
- Native American: 0%
- North American: 0%
- Northeast Asian: 0%
- Pacific Islander: 0%
- South Asian: 0%
- Southeast Asian: 1%
- Unknown: 2%
- Vietnamese: 0%
Age Composition of OneMatch

- Female, 36+ 35%
- Male, 36+ 22%
- Male, U36 18%
- Female, U36 25%
- Male, U36 Caucasian 10%
- Male, U36 Ethnic 8%
National Public Cord Blood Bank
Objective

Build a national, public inventory of high quality, ethnically diverse stem cells from umbilical cord blood to increase transplant opportunities in Canada and worldwide.
Maximizing Opportunities for Stem Cell Transplant

Model Fully Established

The approved model of the original business case for the Cord Blood Bank has been fully implemented, nationally. The following collection sites were established:

Additionally, stem cell manufacturing and storage facilities were implemented in Ottawa, September 30, 2013, and Edmonton, January 26, 2015.
Maximizing Opportunities for Stem Cell Transplant

**Model: National Public Cord Blood Bank**

Five collection sites and two manufacturing facilities for processing, storage and distribution.

**Canadian Blood Services**

- **Medical and Scientific Advisory Committee**
- **Searching, Matching**
- **OTTAWA Manufacturing Facility** (Sep. 2013)
- **EDMONTON Manufacturing Facility** (Jan. 2015)
- **Canadian Transplant Programs**
- **Canadian Research Scientists**
- **International Registries**
- **OTTAWA Collection Sites** (2) (Sep. 2013)
- **BRAMPTON Collection Site** (1) (Jul. 2014)
- **EDMONTON Collection Site** (1) (Jan. 2015)
- **VANCOUVER Collection Site** (1) (Jan. 2015)
- **Many CBS Support Areas:**
  - eg, HLA & Transmissible Disease Testing, Marketing, Logistics, Shipping
- **CBS Research Ethics Committee** (units unsuitable for transfusion)
Maximizing Opportunities for Stem Cell Transplant

Operations to Date

As of October 19, 2015:

- 6,518 mothers have donated their baby’s cord blood
- 1,161 cord blood units have been banked
- 502 cord blood units are listed nationally and internationally for searching and matching
- Cost per cord blood unit:
  - **No charge** to Canadian transplant centres
  - $40,000 USD to international transplant centres
  - Transplant inquiries are occurring
Quality Driven

- **Accreditation:** To ensure the safety and efficacy of the cord blood stem cell product for therapeutic use, CBS complies with Canadian regulatory requirements, and is seeking accreditation from AABB (American Association of Blood Banks) which is recognized internationally. The cord blood bank is being inspected by AABB in November 2015 and anticipates receiving accreditation in Q4.

- **Ethnically diverse inventory:** There is a direct link between stem cell donations and matching to a patient based on ethnicity. The CBB focus is to build a highly diverse inventory to help offset the OneMatch registry.
Quality Driven – Impact of TNC cut off

- **High TNC cut-off** was established, as the higher TNC tends to result in a better outcome for the patient and shorter hospital recovery times, therefore, reducing healthcare costs:

  - $1.5 \times 10^9$ – Caucasian
  - $1.3 \times 10^9$ – Non-Caucasian
Maximizing Opportunities for Stem Cell Transplant

Ethnicity of CBUs Listed

Goal of Cord Blood Bank is to offset composition of OneMatch registrants.

**Target:**
60/40, Non-Caucasian/Caucasian

**Currently:**
49/51, Non-Caucasian/Caucasian, but trending toward 60/40, as more cord blood units from more highly diverse collection sites such as Brampton and Vancouver are released into inventory and listed for transplant.
Maximizing Opportunities for Stem Cell Transplant

Ethnicity of CBUs Collected

Target:
60/40, Non-Caucasian/Caucasian

Canadian Blood Services
it's in you to give
Cord Units Procured for Canadian Patients

does not include procurement for Quebec Patients
Questions?
Canadian Blood Services

it's in you to give