



CBS National Public Cord Blood Bank



“Did you donate your
cord blood?”

Tanya Petraszko MD FRCPC
October 2014


Canadian Blood Services
it's in you to give

Overview

- What is a stem cell?
- The importance of HLA
- Need for cord blood stem cells
- 'For all Canadians'
- Building the bank
- Moving forward

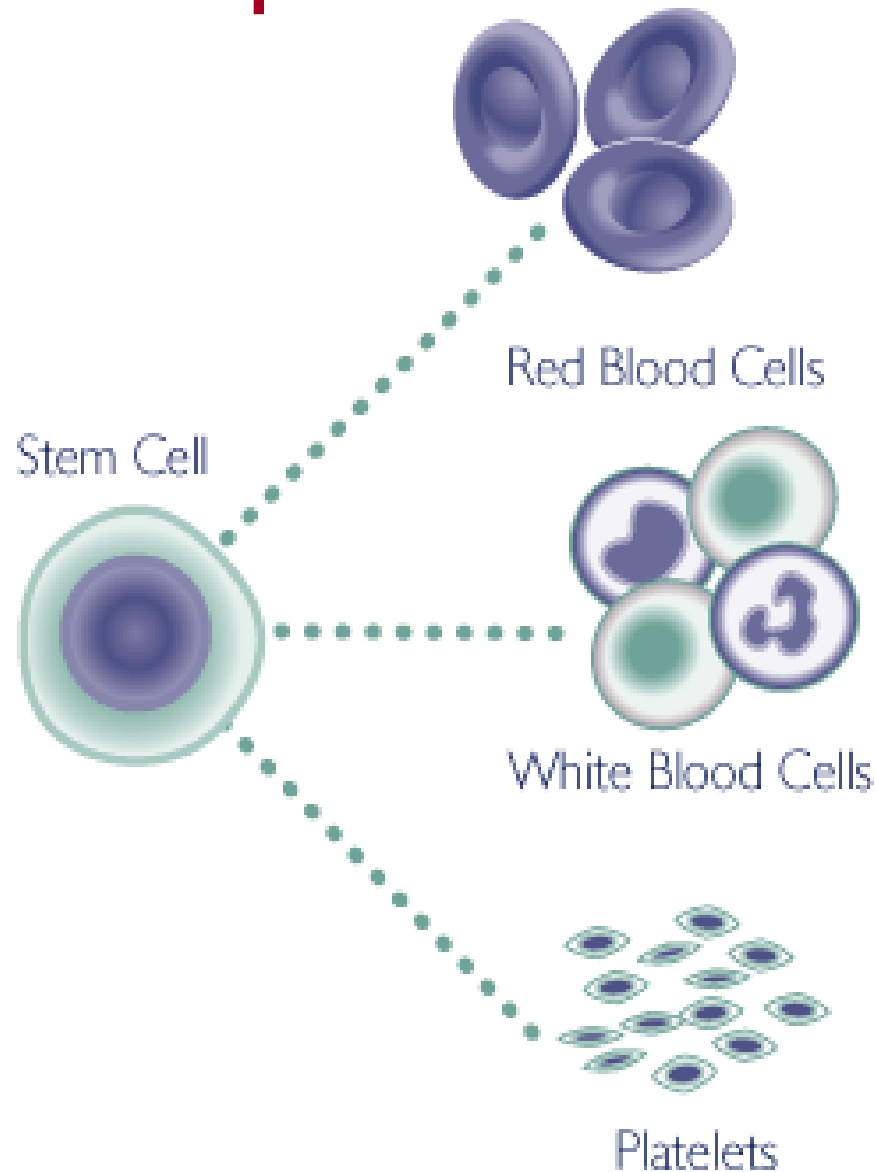


Stem Cell

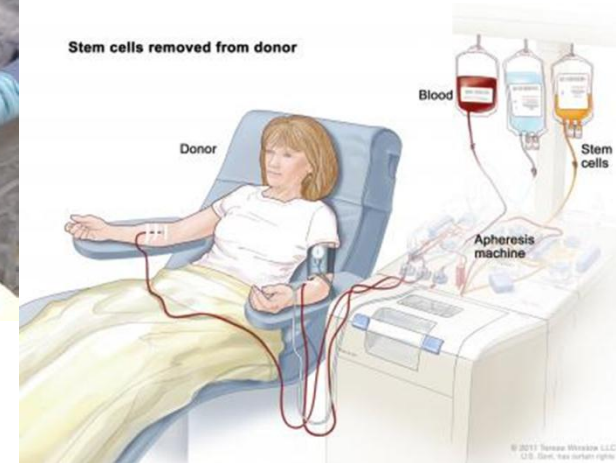
- Refers to any cell that has the capacity for:
 - Self renewal
 - AND
 - Differentiation
- First discovered in hematopoietic cells but likely in many other tissues



Hematopoietic Stem Cells



3 Sources of Stem Cells



What is HLA system?

- The major barrier to transplantation:
 - a series of molecules/proteins that all come from a closely linked system of genes
- Their function is to help the organism recognize self from non self
- Gene system is the Human Leukocyte Antigen system (first discovered on white cells)



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



OneMatch

Canadian Blood Services' OneMatch Stem Cell and Marrow Network,

- recruits healthy, unrelated, volunteer blood stem cell donors
- conducts searches for patients who need an unrelated blood stem cell transplant
- coordinates the collection and delivery of blood stem cells when a match is found
- NPCBB is part of this



OneMatch Registry and National Public Cord Blood Bank

- OneMatch Registry is the 10th largest registry in the world with over 330,000 donors.
 - *established in 1988.*
- National Public Cord Blood Bank Canada
 - *approved in March 2011*



OneMatch Fast Facts – June 2013

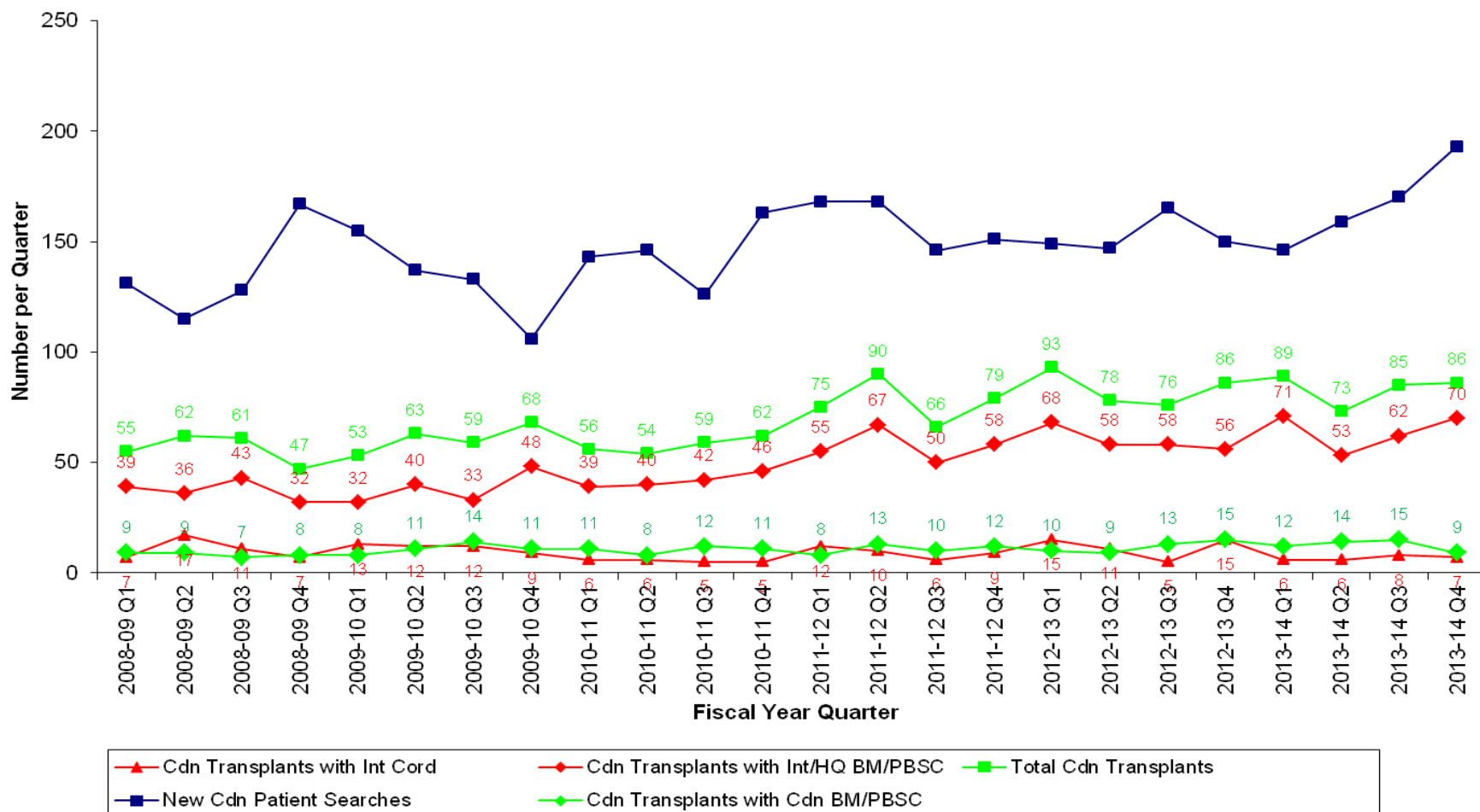
- Searchable donors: **317,810**
- Canadian Transplant Centres: **18**
- Canadian Collection Centres: **10**
- International Registries: **69**
 - Over **21,327,461** registrants worldwide
- International Cord Blood Banks: **49**
 - Over **580,675** umbilical cord blood units



Francis,
OneMatch Registrant

Q1 2014 Factors: Industry Information

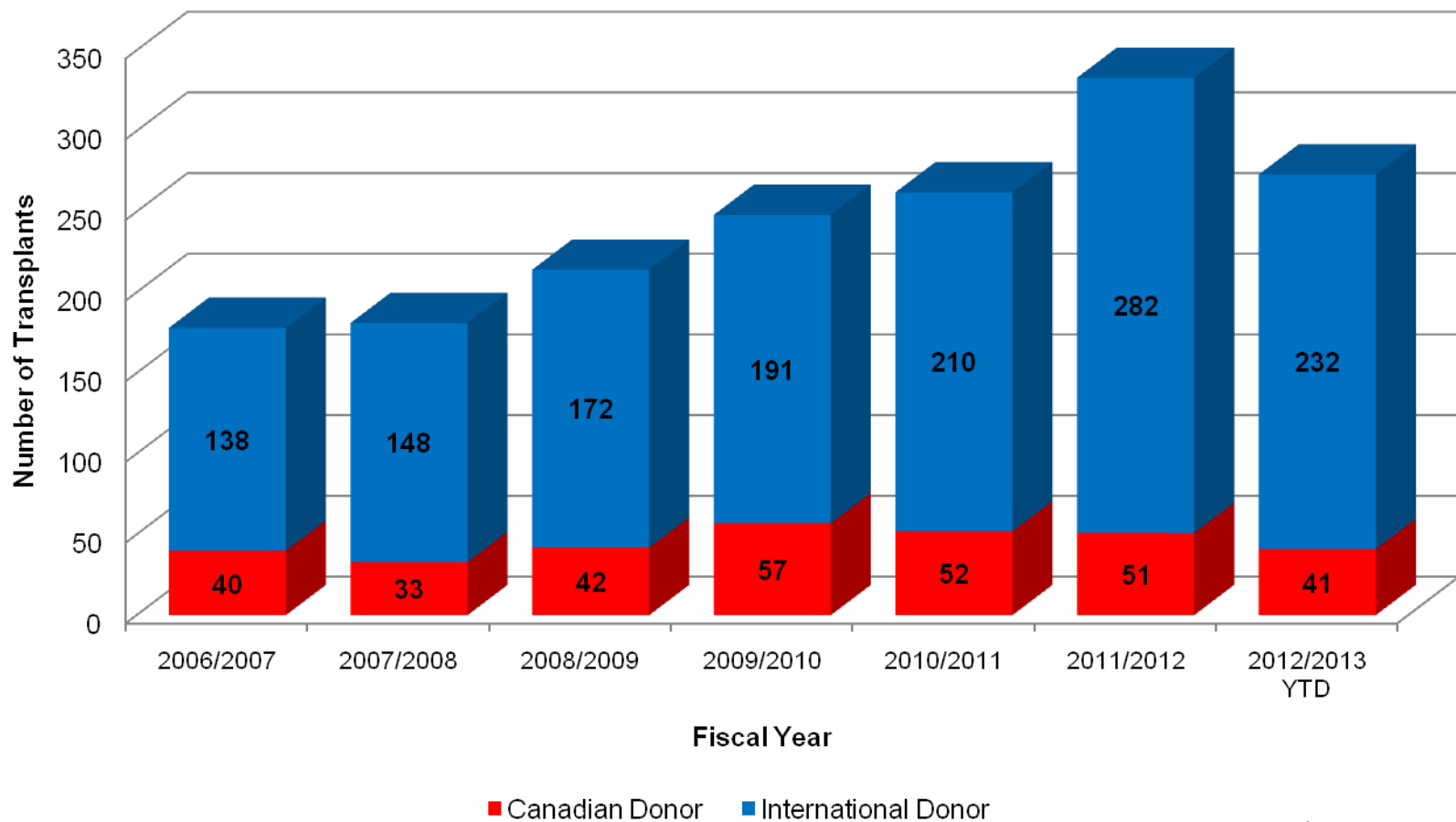
Meeting the Canadian Patient Stem Cell Need, OneMatch



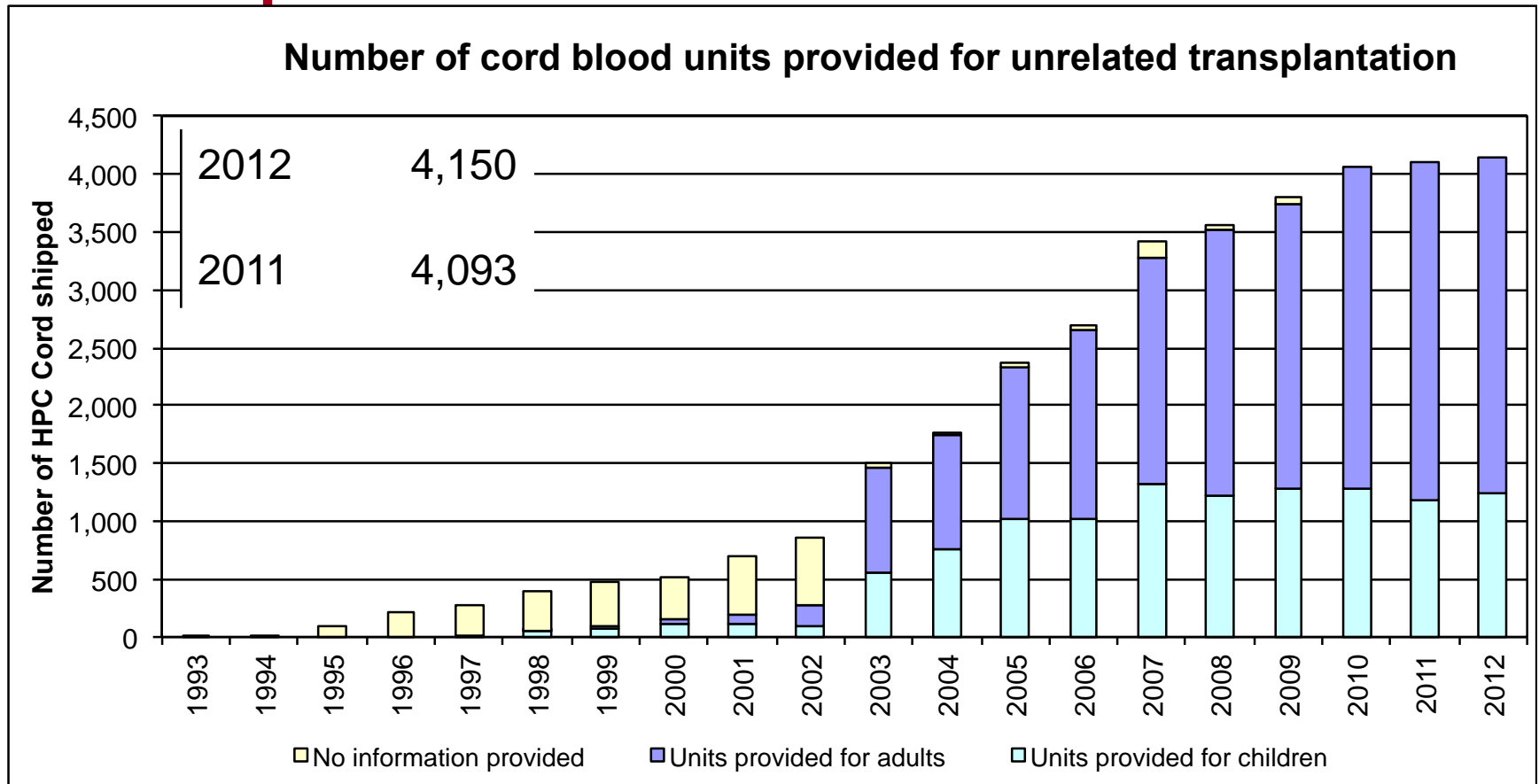
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Canadian Unrelated Transplants -Bone Marrow & PBSC-



Number of Cord Blood Units provided for Unrelated



Need for Cord Blood Stem Cells

- For all stem cell sources, **the racial and ethnic group** of the patient strongly influences the likelihood of having a suitable graft identified
- Growth of the cord blood unit inventory holds more promise than adult donor recruitment in efforts to narrow discrepancy between Caucasians and minority patient groups

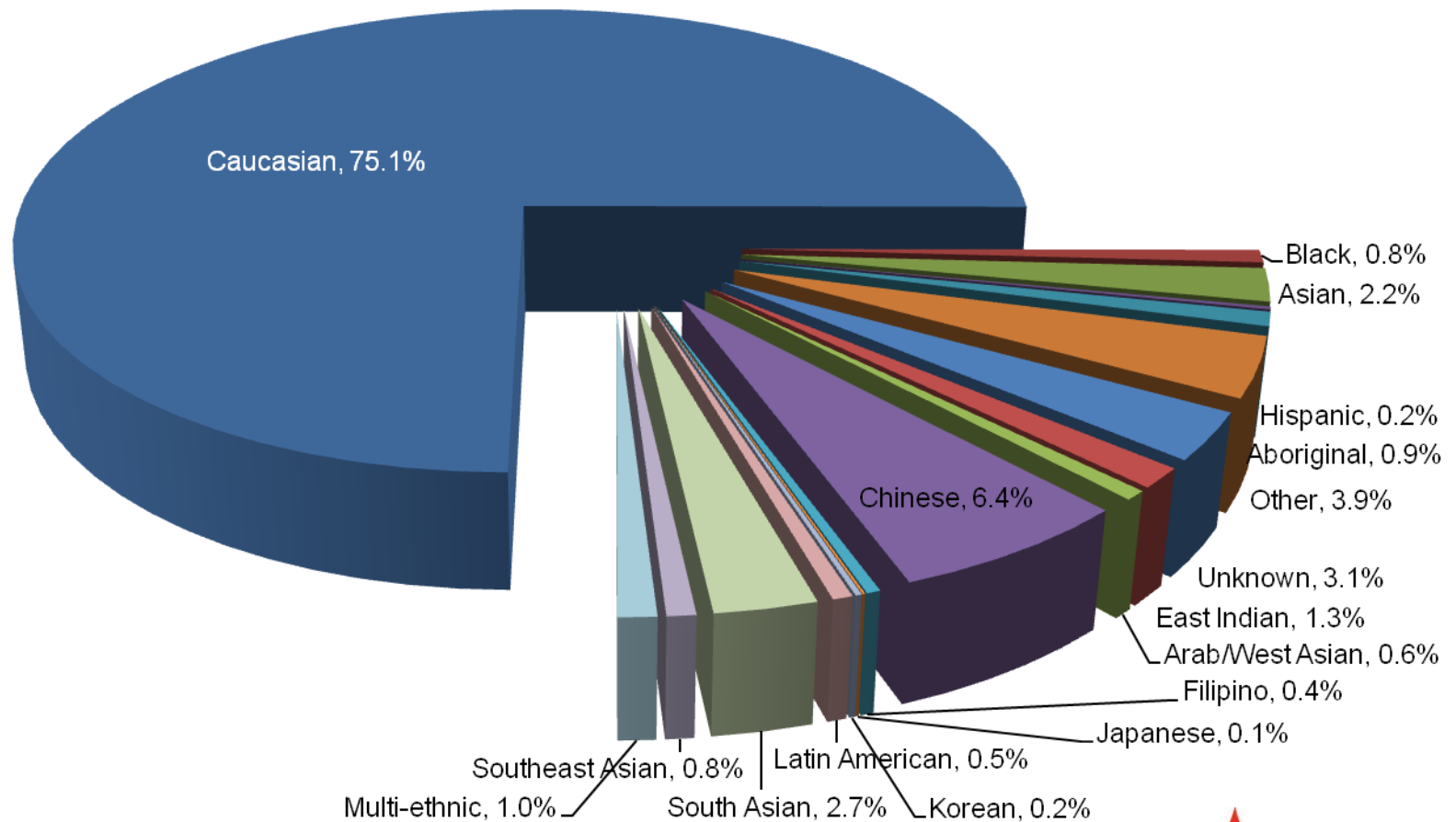


Cords and Ethnic Diversity

- US National Marrow Donor Program
 - HLA genotypes from 10,000,000+ adult donors and 180,00+ CBU
- Rate of 8/8 match
 - Caucasian European 75%
 - Caucasian of Middle Eastern or North African 46%
 - Asian, Hispanic, Native Americans 27-50%
 - Black Americans of all backgrounds 16 -19%%
- Due to under representation in donor pool AND increased diversity in the minority groups
- Gragert et al NEJM 2014



Ethnic Composition of OneMatch Database



Cords and Ethnic Diversity

- Higher likelihood of match as only 6/6 required
- Likelihood of 6/6 match
 - European descent: 17% adult recipient, 38% child
 - African American: 6% adult, 2% child
- Likelihood of 4/6 match
 - 80% in ALL adult populations, virtually all in caucasians
 - Virtually all children in all ethnic groups

Gragert et al NEJM 2014



In other words

Likelihood of matched donor for Non Caucasians:

Adult registry donor (8/8)

– 15-30%

Cord blood unit (4/6)

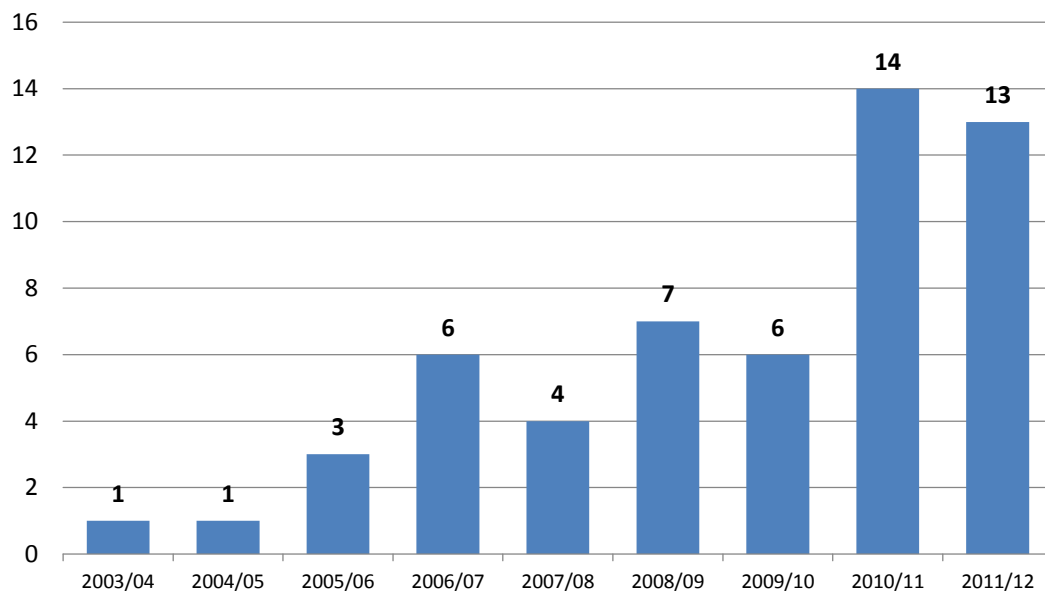
– 80%



Canadian First Nations, Metis and Inuit Patients

Number of Patients	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Active	0	1	1	1	3	6	4	6	4	12	13
Cancelled	0	39	42	43	49	50	61	71	75	79	95
Preliminary	0	0	0	0	0	0	0	1	2	2	1
Workup	0	0	1	1	0	0	0	0	1	1	0

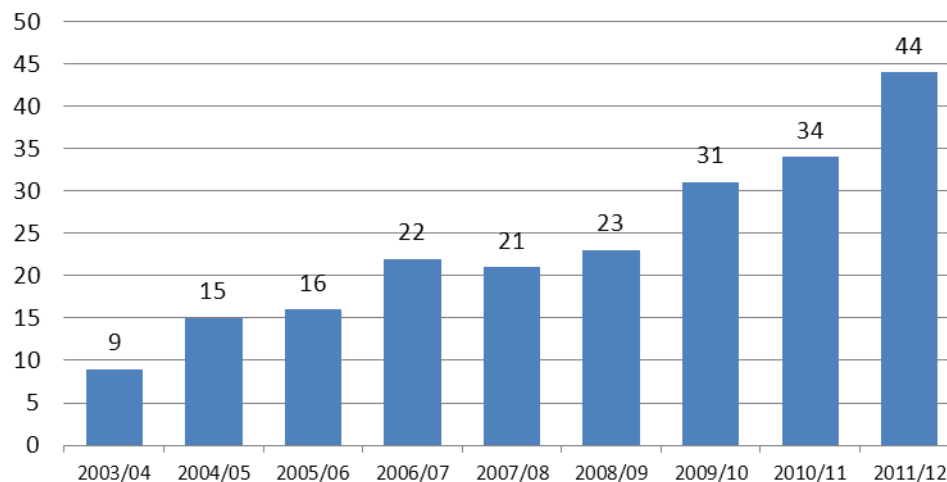
Number of Aboriginal Patient Searches



Canadian Black Patients

Number of Patients	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Active	0	6	9	14	15	22	19	21	31	31	44
Cancelled	0	82	87	91	101	105	119	128	137	152	164
Preliminary	0	0	0	1	1	0	2	2	0	3	3
Workup	0	0	1	1	0	0	1	0	0	1	2

Number of Black Patient Searches



Why Cord Blood

- No risk to mother or newborn baby
- Collected in advance, tested and frozen, ready to use
- More lenient HLA matching-increased chance to find a suitable donor
- lower incidence of GvHD
- Unit is small, enough for a child or small adult
- 2 CBUs needed for adults
- Cost = ~\$40,000/CBU purchased internationally



Tuesday, September 23, 2014
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Cord blood donor found for Quebec woman battling leukemia for second time

Doctors say they have found an umbilical cord for a Mai Duong.

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reddit this!



“For All Canadians” Fundraising Campaign

- \$9.2 million raised to date of \$12.5 million
- still building the bank
- 3.3 million to be realized for full expansion as the bank inventory grows in the years ahead.




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MARGARET ATWOOD
Cord blood shouldn't be a private matter

MARGARET ATWOOD
Special to The Globe and Mail
Published Monday, Sep. 15 2014, 3:00 AM EDT
Last updated Tuesday, Sep. 16 2014, 7:11 AM EDT

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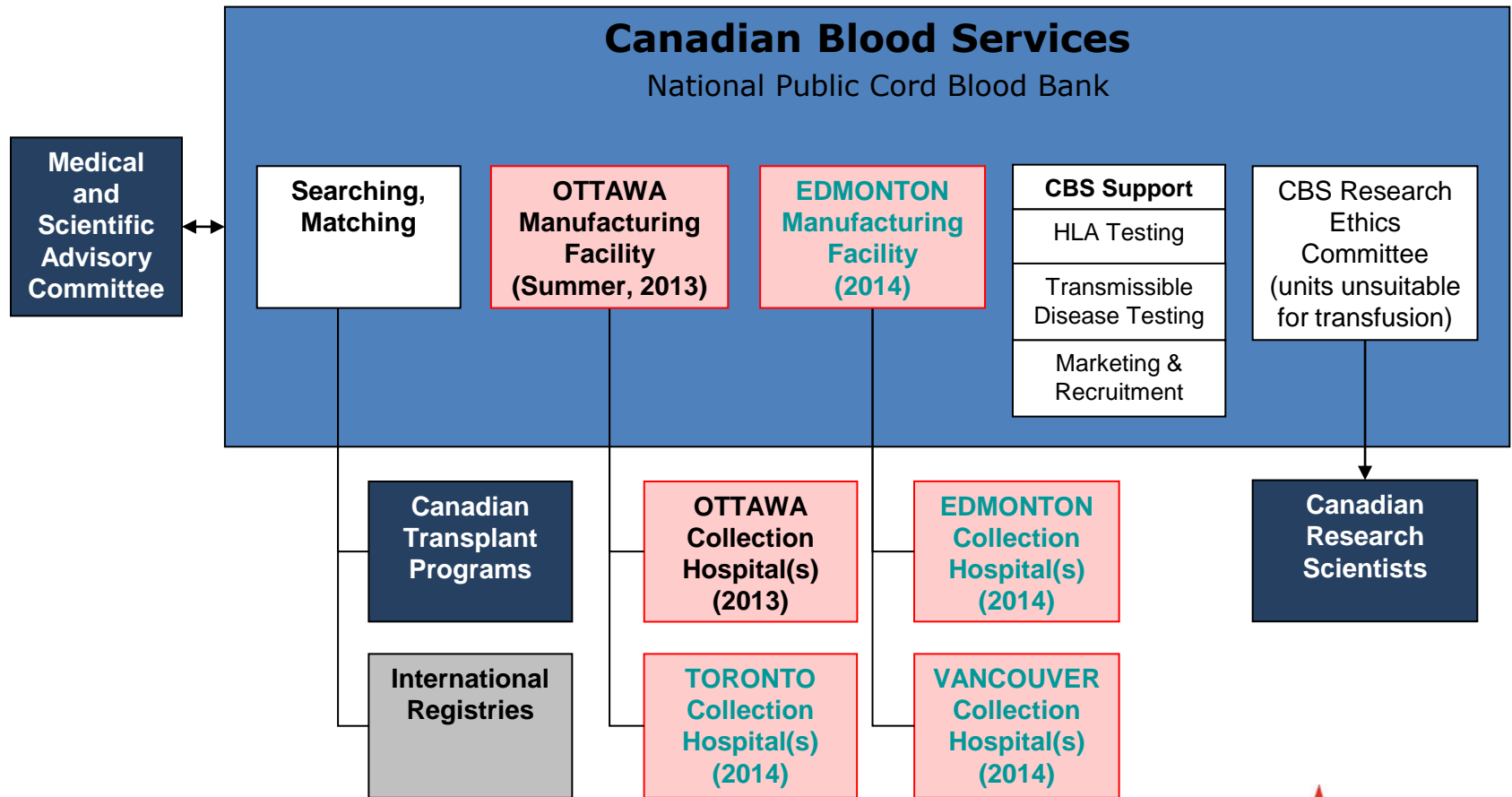
I am For All Canadians

".....because as a mother of children of mixed ethnicity, I understand how important a national public cord blood bank is to improve the odds of finding a life-saving match for many Canadian patients. Today, only 50 percent of patients are able to find a stem cell match that can save their lives and the odds are even lower for patients of mixed ethnicity. We need a made-in-Canada solution that will provide more hope and more options for all Canadians."



Sarah McLachlan
Mother, Sister, and Songstress

National Public Cord Blood Bank



Awareness



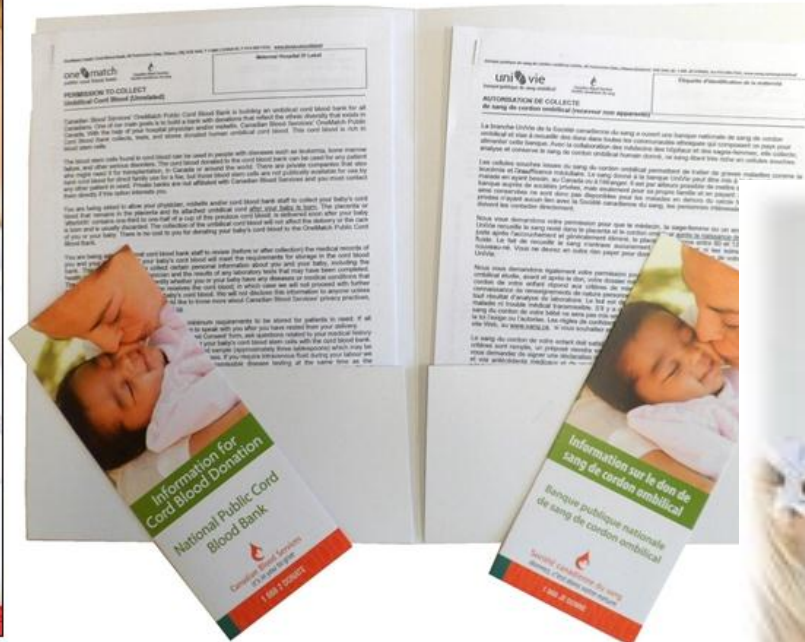
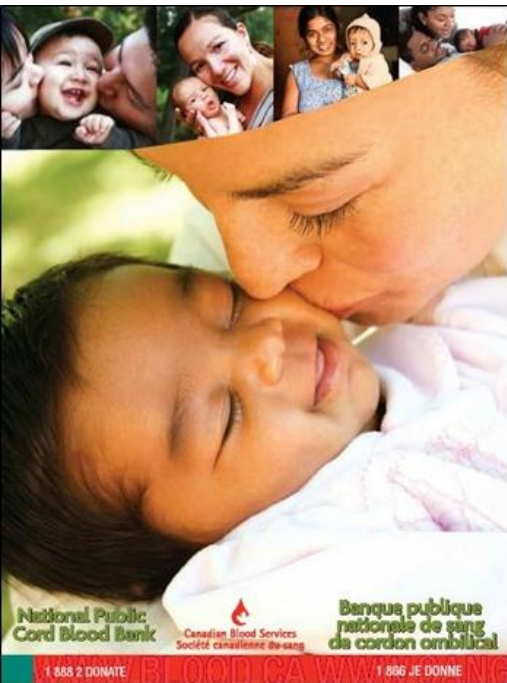
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Recruitment



- Community Events
- Health Care Providers
- Arrive on special day with Permission to Collect form ready
- No advance registration

Who Can Donate?

- Healthy pregnant women, 18 years of age
- Absence of diseases or medical conditions that could be passed on to a recipient
- 34 weeks gestational age
- Single pregnancy, no multiples
- must deliver at one of our designated collection hospitals



Collection



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Manufacturing

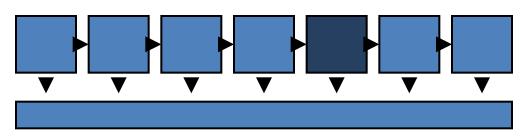
Includes
receiving and assessing
quality control testing
processing



Cryopreservation

- Controlled rate freezing using ThermoGenesis BioArchive freezer
 - ❑ Holds up to 3,636 units
- Liquid nitrogen storage (-196°C)
- Inventory controlled / tracked
- Must be stored within 48 hours of collection; can be stored indefinitely





Searching and Matching

- Listed on OneMatch Registry
- Cords listed, searched and requested
- Searched both nationally and internationally



Distribution

Requested Cord Blood for Transplant

- Manufacturing selects, releases, packs and ships
- Transport – courier



Building the NPCBB

Go-live in Ottawa and Brampton!



- **September 30, 2013** – Phase I of the National Public Cord Blood Bank went live in Ottawa with units being collected and banked for transplant purposes.
- **July 7, 2014** – Phase II of the National Public Cord Blood Bank went live in Brampton with units being collected and banked for transplant purposes.
- Edmonton & Vancouver are next

The Ottawa Hospital:
Civic & General
Campuses



Collection Partners

Lois Hole Hospital for Women



Brampton Civic
Hospital (WOHS)



BC Women's Hospital
and Health Center



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TOH General Campus



Exciting Ottawa news!



- First CBU at Civic Campus-
July 12, 2012



- First CBU at General Campus-
October 24, 2012

Brampton Collections

William Osler Health System, Brampton Civic Hospital



First collection took place on
March 4th, 2014



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Phase II – Edmonton Collections

Lois Hole Hospital for Women



First collection took place on
February 24th, 2014



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Phase II – Vancouver Collections

BC Women's Hospital and Health Centre



First collection took place on February 18



Phase I – Ottawa Manufacturing

Testing



Phase I – Ottawa Manufacturing

Cryopreservation



Phase II – Edmonton Manufacturing Processing



Phase II – Edmonton Manufacturing

Cryopreservation



Ottawa Metrics since launching Sept. 30, 2013

2013-09-30 to 2014-09-30			
	Caucasian	Non-Caucasian	Total
Collected	977	1042	2020
In Process	178 (18% of collected)	217 (21% of collected)	395 (19.5% of collected)
Not Bankable	799 (81% of collected)	825 (79% of collected)	1625 (79.5% of collected)

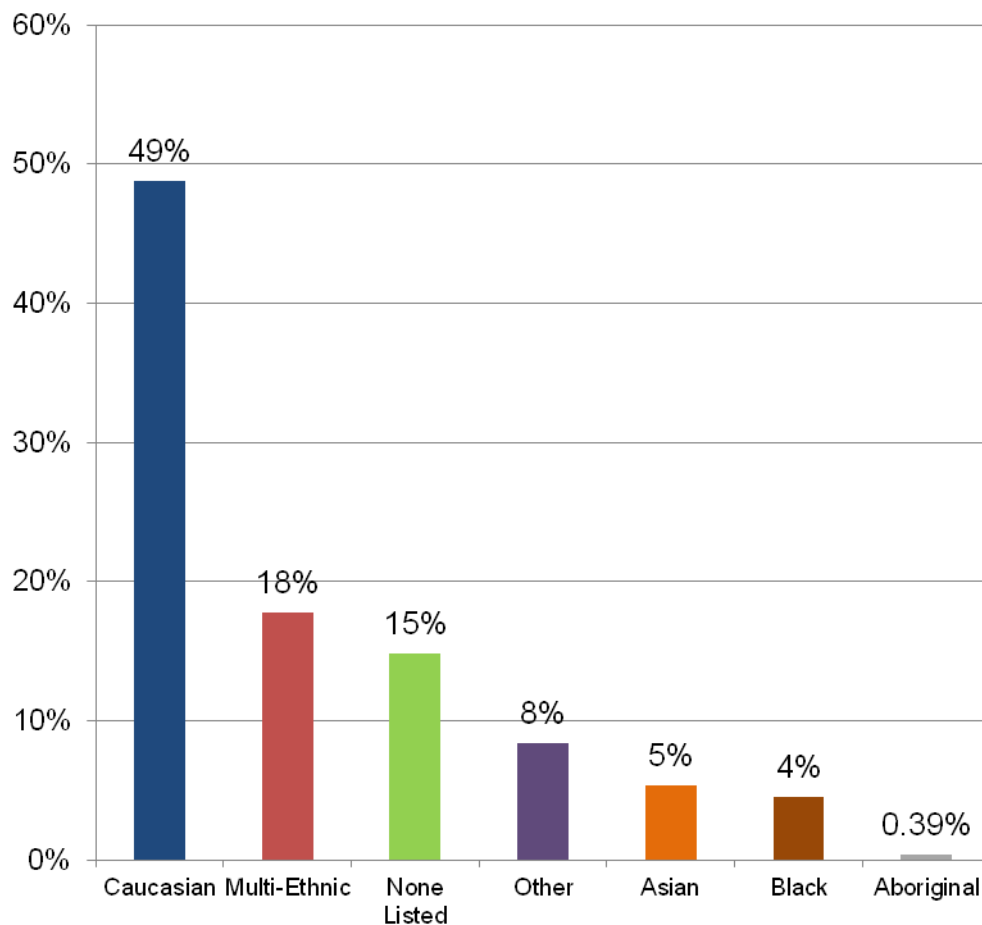
Brampton Metrics since launching July 7, 2014

	Fiscal Year 2014 -2015 2014-07-07 to 2014-09-30		
	Caucasian	Non-Caucasian	Total
Collected	57	167	224
In Process	9 (16% of collected)	40 (24% of collected)	49 (22% of collected)
Not Bankable	32 (84% of collected)	127 (76% of collected)	175 (78% of collected)



Ottawa

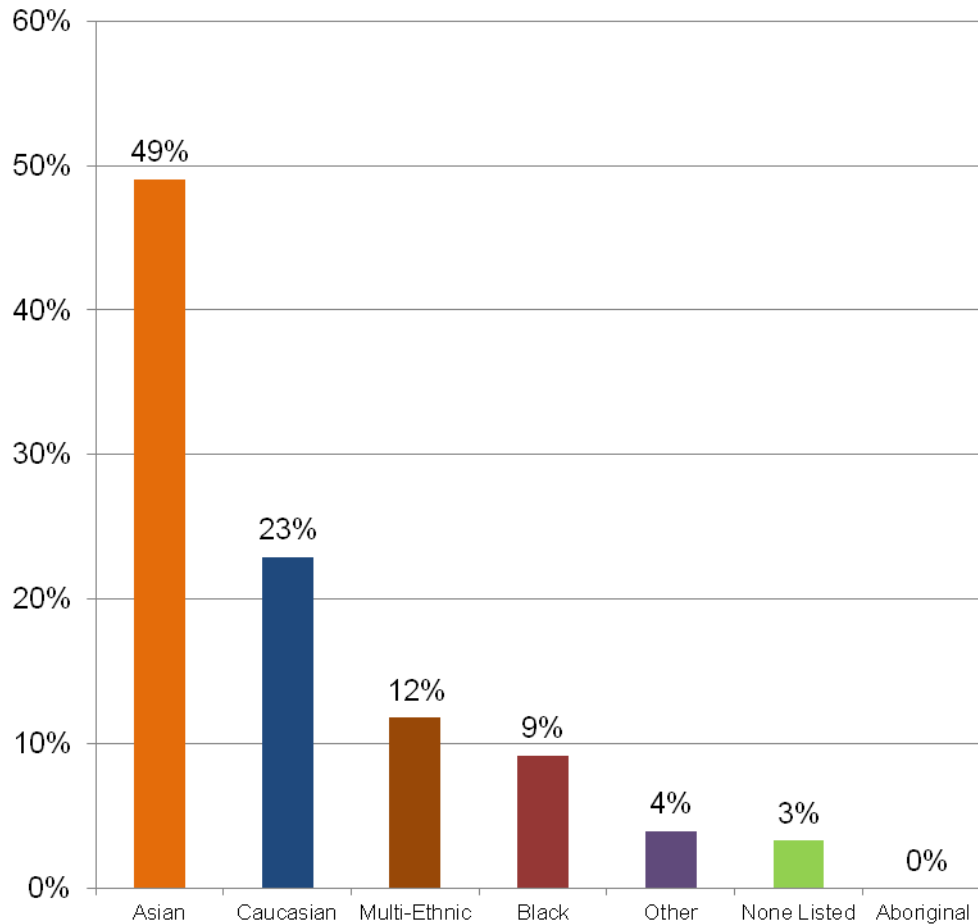
Ethnicity of All Cord Blood Units Collected



Caucasian	49%	
Multi-Ethnic	18%	
None Listed	15%	
Other	8%	Arab
		69%
		Hispanic
		15%
		Jewish-Ashkenazi
		3%
		Jewish-Sephradac
Asian	5%	1%
		Pacific Islander
		0%
		Other
		13%
		Central Asian
		10%
Black	4%	Chinese
		25%
		Filipino
		10%
		North Asian
		1%
		Northeast Asian
Aboriginal	0.39%	6%
		South Asian
		29%
		Southeast Asian
		19%
		African
		60%
		Caribbean
		28%
		Other
		11%
		First Nations
		43%
		Inuit
		43%
		Métis
		14%

Brampton

Ethnicity of All Cord Blood Units Collected



Asian	49%	Central Asian	0%
		Chinese	0%
		Filipino	4%
		North Asian	5%
		Northeast Asian	7%
		South Asian	71%
		Southeast Asian	13%
Caucasian	23%		
Multi-Ethnic	12%		
Black	9%	African	29%
		Caribbean	64%
		Other	7%
Other	4%	Arab	17%
		Hispanic	50%
		Jewish-Ashkenazi	0%
		Jewish-Sephardic	0%
		Pacific Islander	0%
		Other	33%
None Listed	3%		
Aboriginal	0%	First Nations	0%
		Inuit	0%
		Métis	0%

Next steps

- \$3.3 million required to expand project west
- Validation of equipment, staff, procedures in West
- Spread the word, we need moms
- Go live end of 2014
- 18,000 units 'in the bank' going forward



Thank you

- Tanya.Petraszko@blood.ca
- www.campaignforcanadians.ca



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