

Adapting a Unique Supply Chain Model

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Chief Supply Chain Officer, Canadian Blood Services
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Linking the nation

“Every time I donate blood, I encourage others to join me — it’s important to my family to give back to the community.”

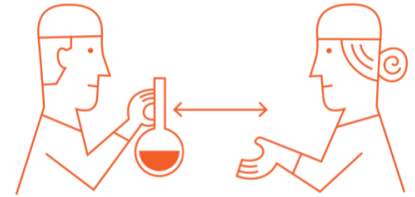
Chris, father of Arthur,
blood recipient

Unique organization, distinctive delivery model

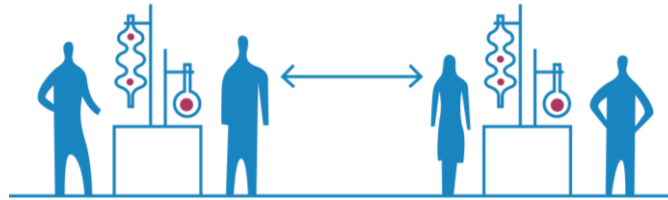
Some fundamental tensions:

- An independent, non-profit, charitable corporation **and** a biologics manufacturer regulated by Health Canada
- Provincial and territorial ministers are our corporate members and funders, **but** we operate at arm's length from governments
- Deliver pan-Canadian, integrated health services **across the grain** of provincial and territorial health systems

Products and services



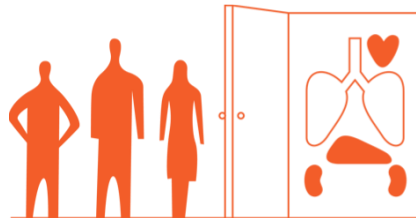
Diagnostic services



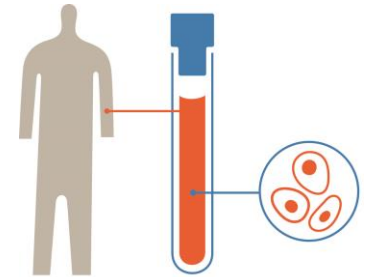
Plasma protein products



Fresh blood products

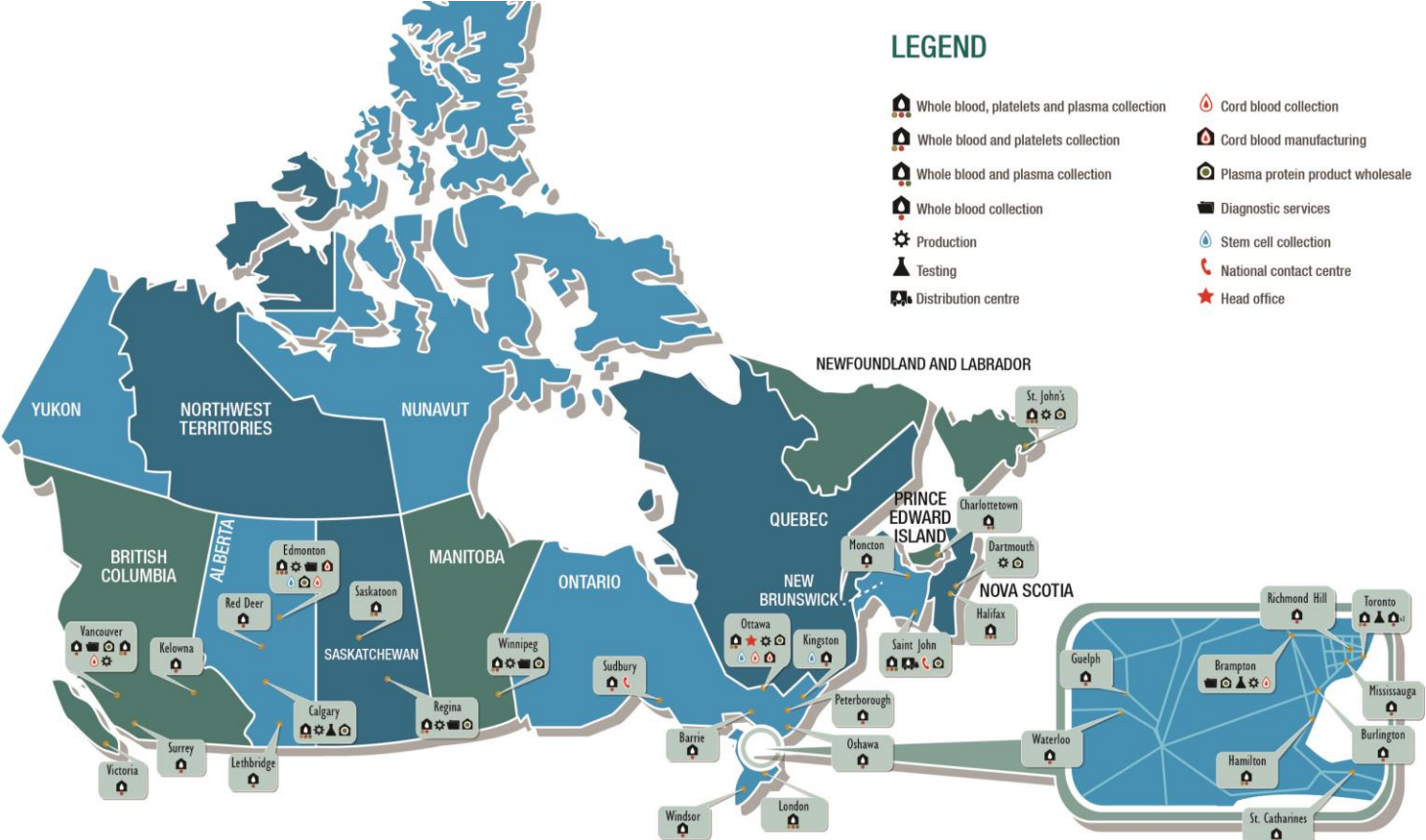


Organ and tissue donation and transplantation



Stem cell program

Equity of access and security of supply



Supply chain considerations and constraints



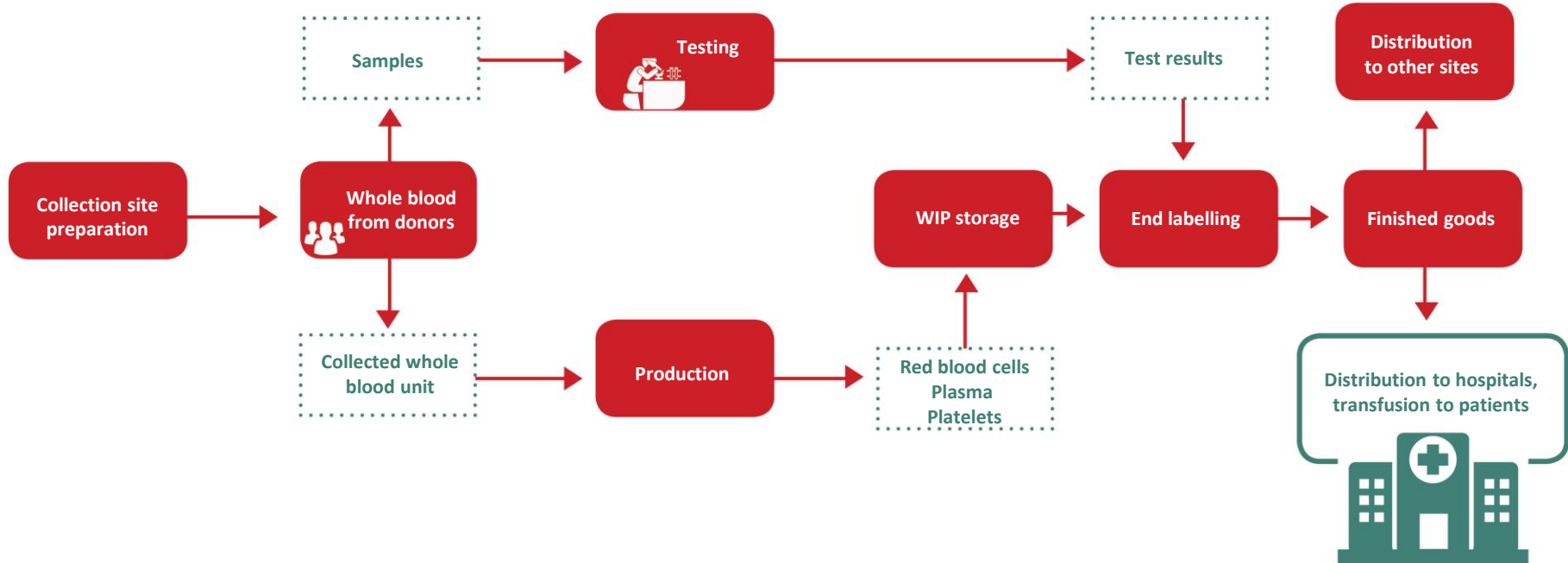
Blood: A complex balancing act

- No supply contracts
- 3–5 days on hand inventory
- 36 collective agreements
- Limited funds to drive continuous improvement
- Political/stakeholder considerations



Considerations and constraints

The path of a blood donation



Daily customized shipments

- Restock hospital blood banks
- Fill specialized product requests
- Meet sudden, urgent hospital demand
- Prioritize product nearing outdate
- Rebalance inventory based on collections

Product	Storage and transport
Red blood cells	1 to 6°C
Frozen plasma	≤ -18°C
Platelets	20 to 24°C
Donor samples	2 to 25°C

Blood: Storage and handling constraints



- Manufacturing within 24 hours of collection limits locations of collection sites
- 7-day shelf life for platelets; 42-day shelf life for red blood cells
- Rigid temperature constraints; cold-chain integrity across vast distances and conditions
- Processes tailored for 24/7 delivery

Considerations and constraints

Shipping to northern/remote regions

Hospital	Location	Approx. distance from distribution site
Qikiqtani General Hospital	Iqaluit, Nunavut	2,500 km from Ottawa site
Stanton Territorial Hospital	Yellowknife, Northwest Territories	995 km from Edmonton site
Whitehorse General Hospital	Whitehorse, Yukon	2,300 km from Vancouver site
Lady Dunn Health Centre	Wawa, Ontario	900 km from Brampton site

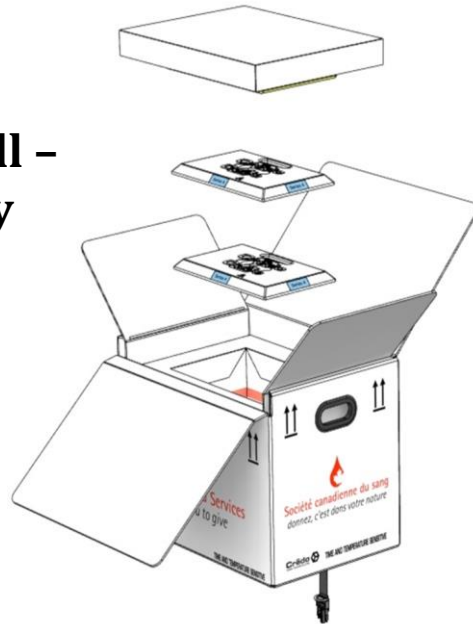
Insulated shipping containers

- 10-year contract in 2014 for development, testing and supply of **improved insulated shipping containers**
- Qualified solutions implemented in all regions related to:
 - Distributing product to hospitals
 - Moving inventory between distribution sites
 - Transporting samples from collection sites to testing labs in Calgary and Toronto
- **Outcome: Reduced complexity, greater efficiencies, excellent thermal control**

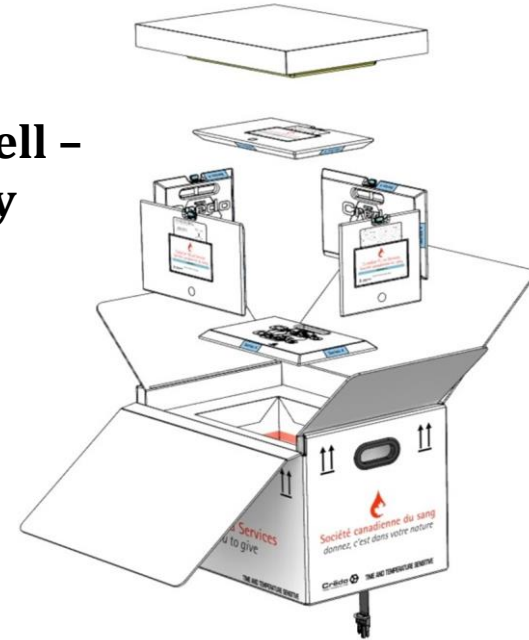
Considerations and constraints

Insulated shipping containers

**Red blood cell –
short journey**



**Red blood cell –
long journey**



Stem cells: Serving Canada and beyond

- National/international scale
- Integrated program including adult registry, cord blood bank, autologous donation
- More than 1,700 units processed in 2016–2017

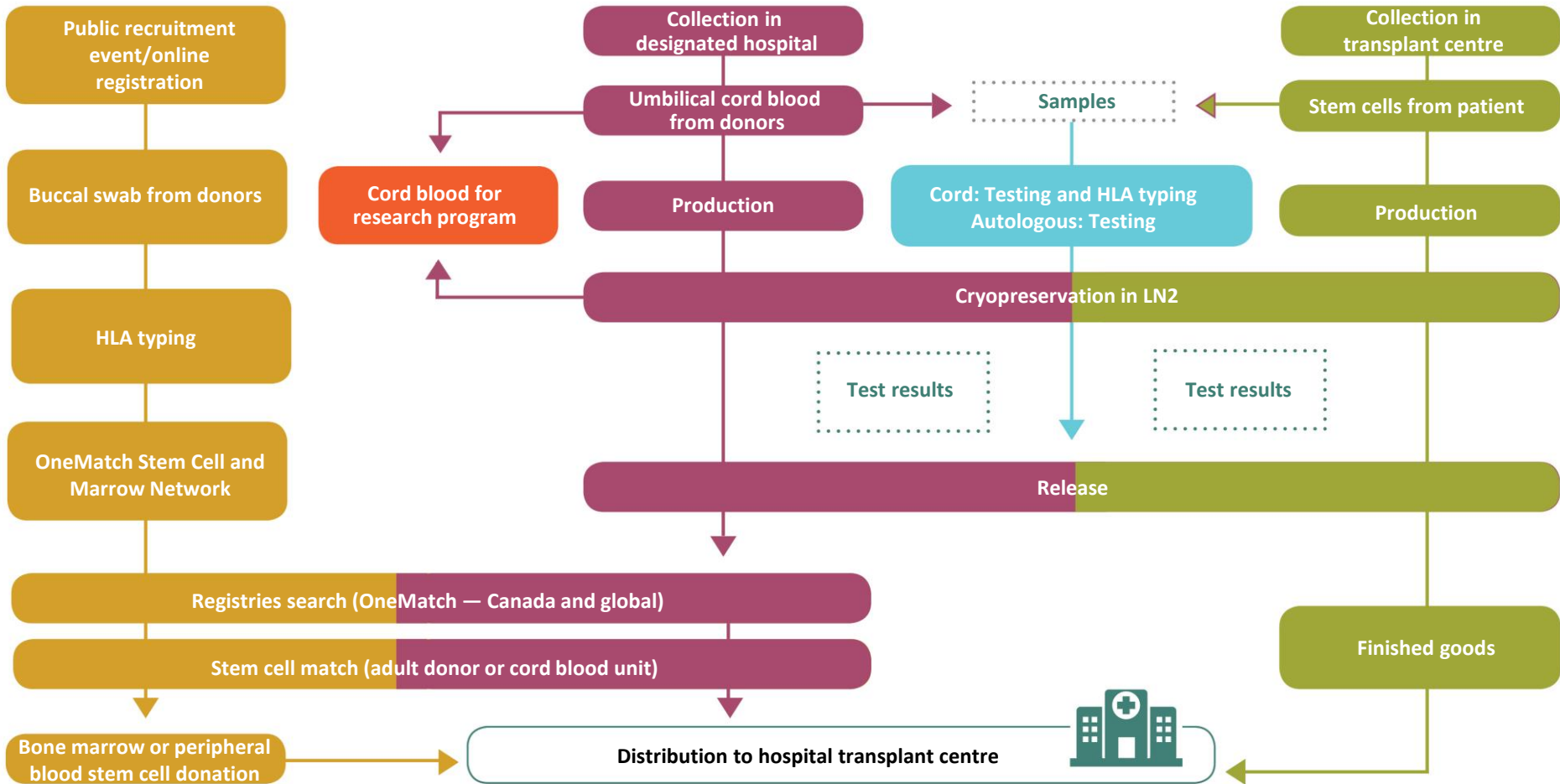
Stem cell recipient, Mackenzie, with donor, Alexander



Adult registry

Cord blood bank

Autologous donors



Considerations and constraints

Storage and handling considerations: Stem cells

Cord blood:

- 48-hour turnaround from collection to freezing cells
- Liquid nitrogen (-196°C) storage
- Transport: dry shippers with liquid nitrogen

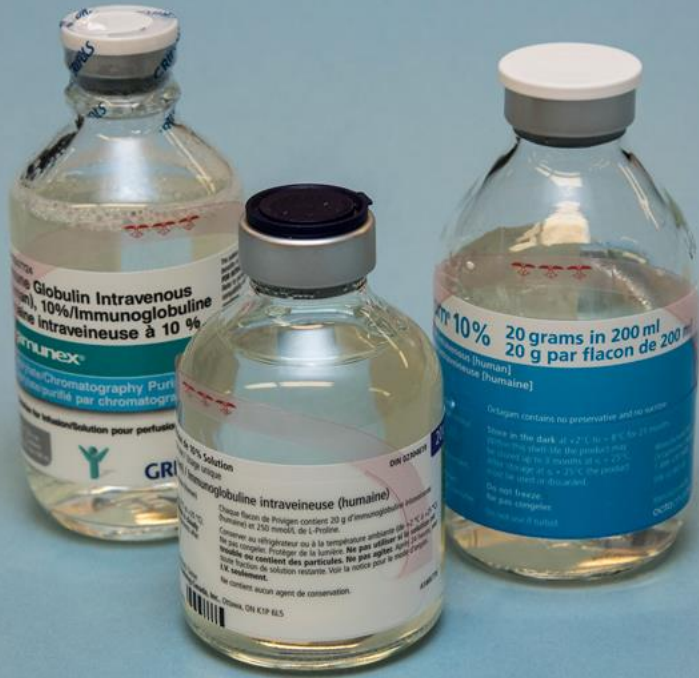
Adult stem cells:

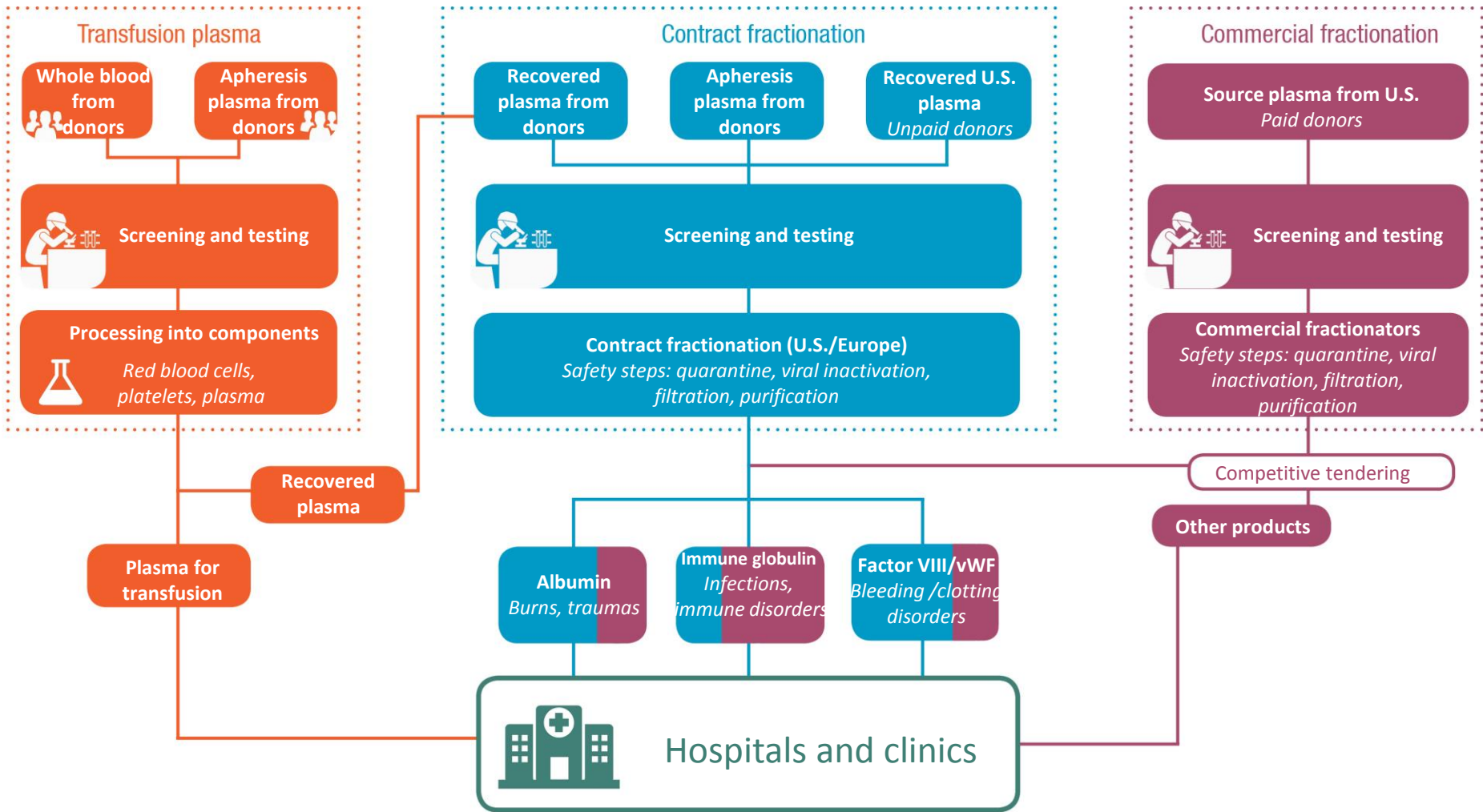
- Specially trained couriers accompany temp controlled international shipments for transplant



Plasma products: National formulary

- Plasma-derived drugs and synthetic alternatives
- Bulk purchase about 45 brands worth \$600M annually
- Public tendering process
- Equity of access for patients across the country





Plasma protein products: storage and handling considerations



Product	Storage and transport
Albumin	2 to 25°C
IVIg	2 to 8°C
Solvent detergent plasma	≤ -18°C

Driving greater value and continuous improvement



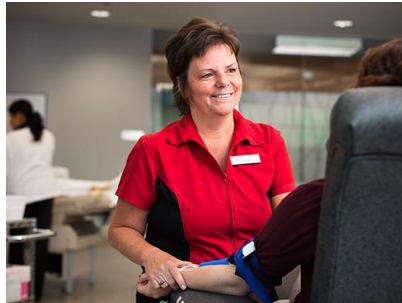
Driving greater value and continuous improvement

Key transformations

Attract and retain donors



Transform facilities; collection sites



Strengthen quality management system



Continuous improvement



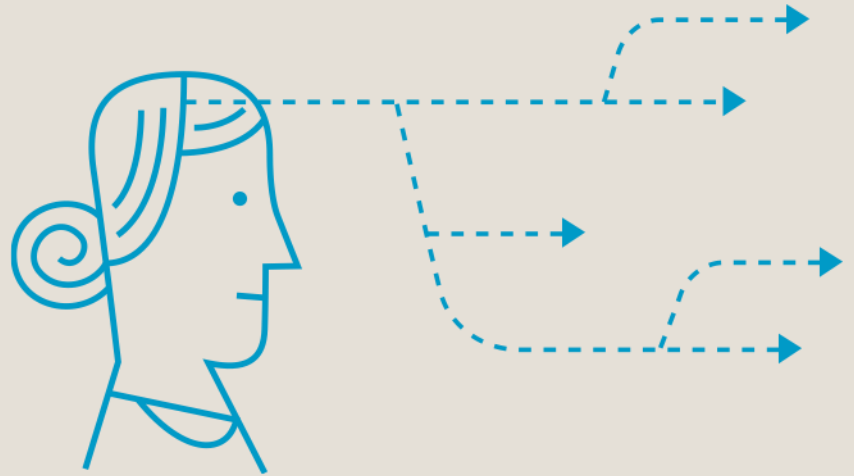
Driving greater value and continuous improvement

Small changes, big impact: Working with Toyota

- 15%↓ customer complaints
- 40%↓ order fulfilment time
- 30%↓ unnecessary steps and movements
- 30%↑ effective use of production equipment
- 25%↑ in operational availability
- Gained two hours per day in production time



Looking to the future



Looking to the future

- **Security of plasma supply for immune globulin (Ig): Increasing plasma collections from Canadian donors**
 - Rapid demand growth; looming supply risk
 - Goal is to decrease reliance on American plasma industry
- **Shift to digital: Donors, hospitals, employees**
- **Meeting the needs of future populations: Urbanization, immigration, ethnic diversity**





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