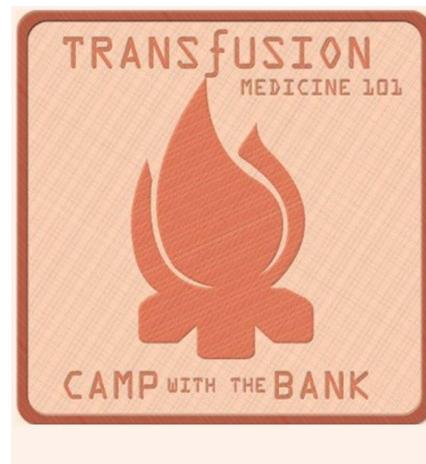


# Newly Available Products and Technologies in 2023

Aditi Khandelwal (she/her)  
Transfusion Camp Day 4



# Conflicts of Interest and Disclaimer

- Canadian Blood Services (Canada, outside Quebec) specific information
- Employee of Canadian Blood Services
- Editor of Clinical Guide to Transfusion, Professional Education (profedu.ca)
- Consultant Hematologist, Transfusion and Apheresis coverage for University of Toronto affiliated hospitals
- No pharma related grants or research funding
- I have not been directly involved in development, production and implementation of products & technologies being discussed today.

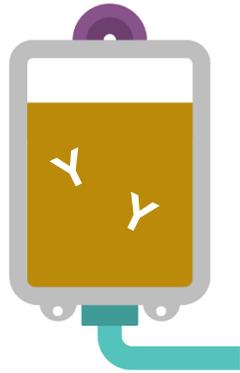
*Humble thanks to the dedicated national transfusion medicine community who have worked tirelessly to bring forth technologies and products being discussed today!*

# Products coming to you

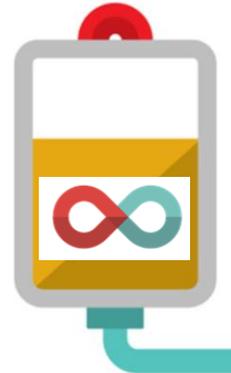
Expanded Inventory Options 2022 - 2023



Solvent Detergent (S/D) Plasma (Octaplasma)

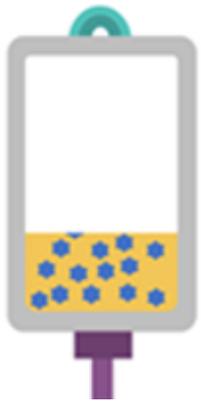


Low titre A-plasma

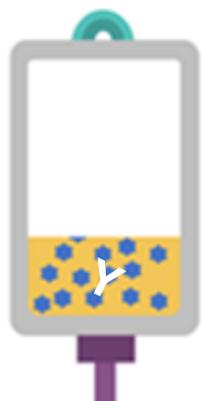


Canadian Blood Services' Pathogen-Reduced Plasma

## PLASMA

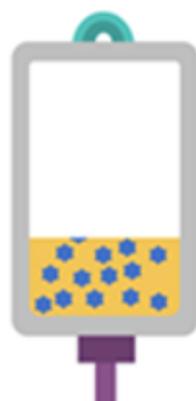


Pooled Platelets Psoralen Treated (PPPT)

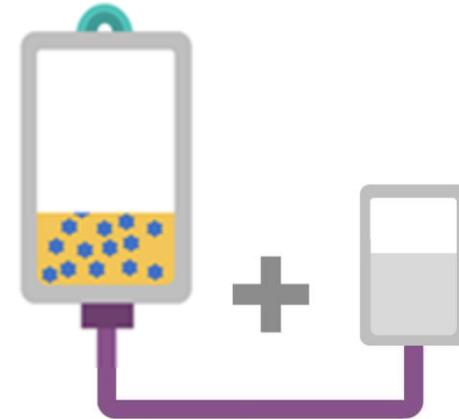


Low titre platelets

Next in line products by 2025



Apheresis platelets psoralen-treated (APPT)



Platelets with PAS (instead of being pooled in plasma)

## PLATELETS

# Solvent Detergent (S/D) Treated Plasma

**By September 2023,  $\geq 80\%$  of transfused plasma will be S/D Plasma  
By 2025, almost all transfused plasma will be pathogen-reduced**

## What is Octaplasma?

- ABO specific, pooled US source plasma by Octapharma
- Pools of ~ 600 – 1500 donations dilutes allo-antibodies
- Processed with solvent detergent wash, filtration, and resin adsorption for prions
- Enveloped pathogens removed
  - Hep A and Parvo B19 are non-enveloped and not completely eliminated by S/D processes
- Prions are removed and risk of vCJD reduced
- Fewer TRALI, FNHTR, allergic reactions
- Eliminates TA-GVHD risk
- Considered safe during pregnancy and in pediatrics
  - Limited data and experience
- Coagulation factor levels are consistent
  - Protein S and alpha-2 antiplasmin is reduced

CBS FP



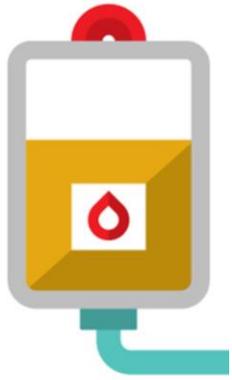
**S/D Plasma  
(Octaplasma)  
Available  
Mar 27 2023**

## SDP vs. FFP:

- SDP safer than FFP with lower adverse reaction rates<sup>1-3</sup>
- Efficacy similar<sup>1-3</sup>
- SDP preferred in liver transplant and TTP on PLEX<sup>1-3</sup>
- Small studies for safety in pregnancy and in pediatrics<sup>4-9</sup>

1. Blood Transfus. 2016 Jul;14(4):277-286
2. Saadah NH et al. Haematologica 2020
3. Liunbruno GM et al. J Thromb Thrombolysis 2015
4. Verghese L. et al. Reprod Bio. 2017.
5. Scully M et al. Blood. 2014.
6. Camazine MN et al. Pediatr Criti Care Med. 2017.
7. Spinella PC et al. Front Pediatr. 2020.
8. Kalsi A. et al. Clin Appl Thromb Hemost. 2018.
9. Josephson CD et al. Transfusion. 2022.

# S/D Plasma Clinical Use



Solvent Detergent  
(S/D) Plasma  
(Octaplasma)

## Indications

- same as frozen plasma
- More data in TTP and liver transplant patients
- Limited data for neonates and in pregnancy
- useful when factor concentrate not readily available (e.g., FV, FXI, FXIII)

## Dose

- FP and S/D Plasma dose is 15mL/kg
- S/D Plasma bag is 200mL vs. usual FP bag up to 300mL
- In 80kg adult => 5 – 6 "S/D Plasma units"

## Contraindications:

- IgA deficiency with history of severe allergic reactions
- severe Protein S deficiency

## Important considerations for MHPs

- Thawing – S/D Plasma requires minimum 30 min vs. ~15min for FP
- Infusion rate max 1mL/kg/min to prevent citrate toxicity

# Pooled Platelets Psoralen Treated (PPPT)

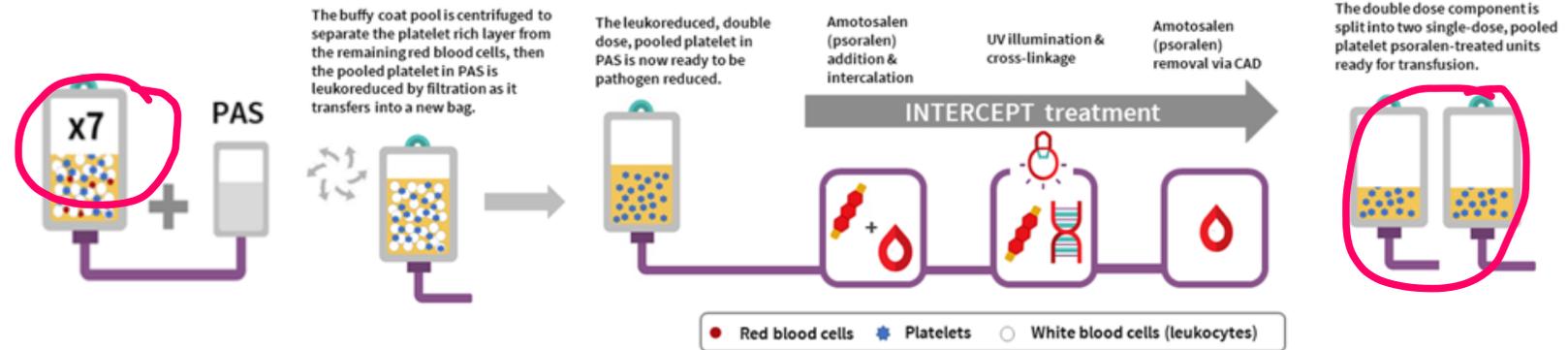
As of 2022:

- Pathogen inactivation using Psoralen treatment is available in Canada
- Phased implementation



## Pathogen Inactivation Technology

- Inactivation of viruses, bacteria, protozoa
- No irradiation necessary for TA-GVHD prevention
- Fewer allergic and febrile non-hemolytic reactions



1. Blood centrifuged with buffy coat separated
2. Buffy coats from 7 donors combined in PAS
3. Leukofiltration
4. Psoralen added and it intercalates with RNA/DNA
5. UV light activates Psoralen and causes damage to RNA/DNA
6. Residual psoralen removed

Pathogen-reduced platelets clinical overview deck are: <https://intercept-canada.com/> ; <https://www.blood.ca/en/hospital-services/products/component-types/circular-information> ; <https://profedu.blood.ca/en/transfusion/clinical-guide/pathogen-reduced-platelets>

# PPPT - Clinical Use

## What is better with PPPT?

- Far lower risk of transfusion transmitted infection
- Other reactions also reduced – TRALI, FNHTR, allergic, acute hemolytic
- No need for irradiation as no proliferating leukocytes
- Considered devoid of CMV (and other virus/bacteria)

## What is same for PPPT and untreated PLT?

- Efficacy, Indications, Dosing

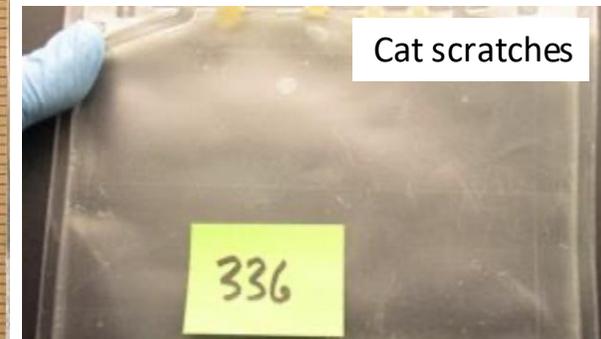
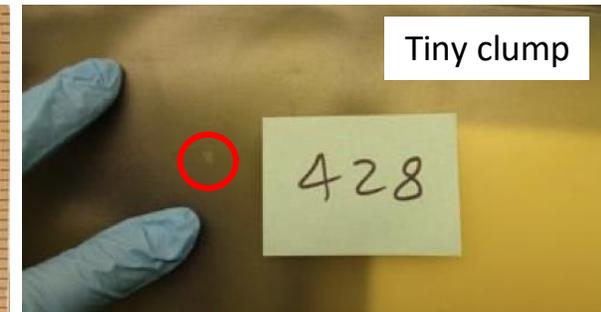
## What are some important considerations?

- Insufficient safety data for intrauterine transfusion
- Count increment per bag of PPPT is lower
  - Each bag contains equivalent of 3.5 pools not 4 pools
  - Increased platelet transfusion by 7%
- More non-HLA Ab mediated PLT refractoriness

## Contraindications:

- hypersensitivity to psoralens
- Pts on extracorporeal photopheresis (ECP) or PUVA due to risk of erythema

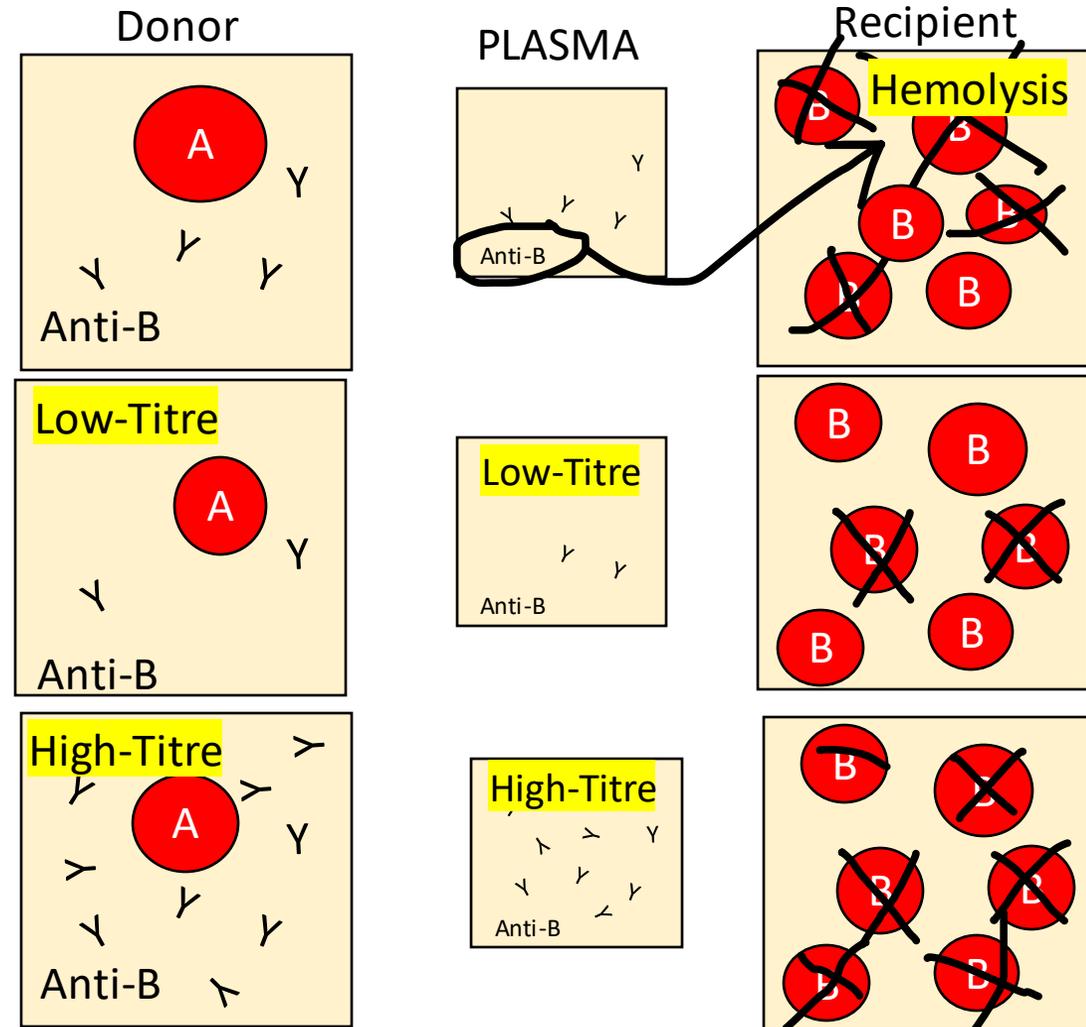
- Lighter yellow
- *5 d shelf-life vs. 7d for untreated PLT*
- 40% plasma/60% PAS-E for PPPT vs. 100% plasma in untreated platelets



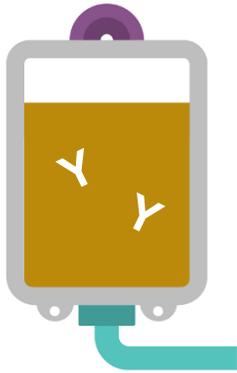
# Low-Titre Platelets and Plasma

- Anti-A/B are naturally occurring antibodies or isoagglutinins
- PLT product contains plasma with isoagglutinins
- ABO mismatched PLT transfusions are routinely performed
- Increasing role for A-plasma in MHP to supplement/replace AB-plasma
- Risk of acute hemolytic reaction
  - Higher anti-A/B => higher hemolysis risk
  - Usually when titre is >1:128 by IS or >1:256 by IAT

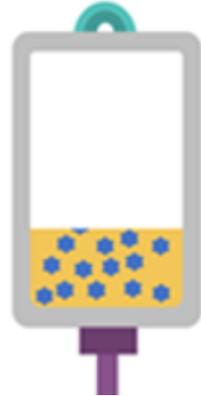
Blood Group Refresher e.g., A plasma to B recipient



# Low-Titre Platelets and Plasma



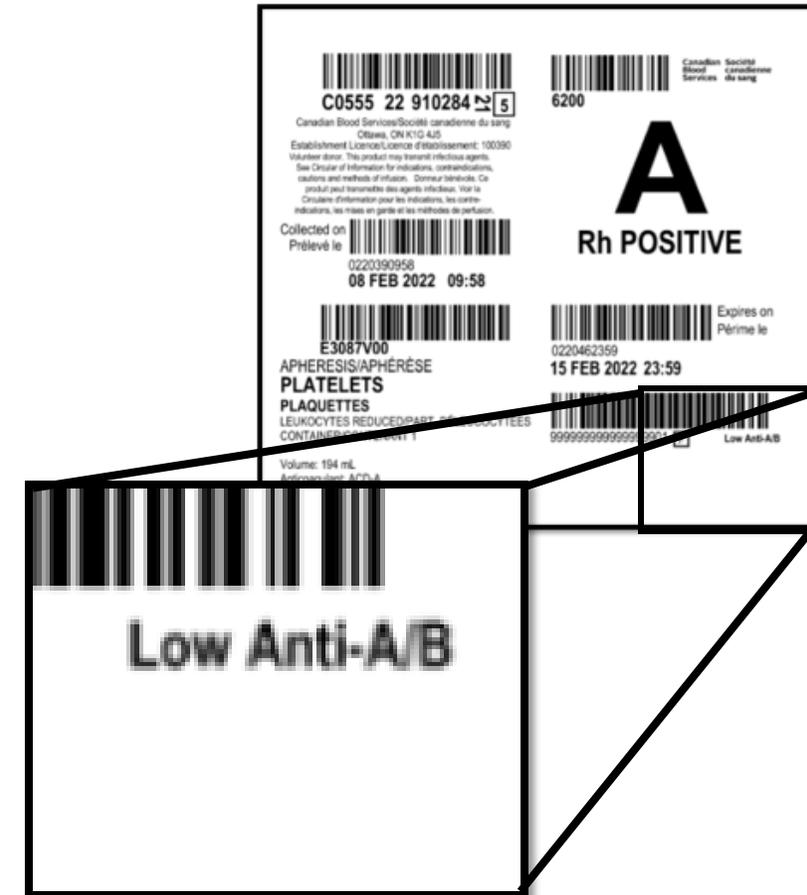
Low titre  
A-plasma



## Low titre platelets

- Pooled untreated PLT
- Apheresis untreated PLT
- PPPT

- Starting November 2022, donors are tested for anti-A and anti-B titres (levels)
- Up to 80% of pooled PLT and 90% of A-plasma products are "low titre" even if they do not carry the label
- For pooled PLT, every donor must be "low-titre" for final product to be labelled "Low Anti-A/B"
- Acute hemolysis risk is reduced but not eliminated



# Acknowledgements

- S/D Plasma Resources: Kathryn Webert, Shuoyan Ning, Michelle Zeller, Robert Romans, Irena Gordon
  - <https://professionaleducation.blood.ca/en/transfusion/publications/faq-solvent-detergent-sd-treated-plasma-octaplasma>
- National Advisory Committee on Blood and Blood Products. NAC Recommendations for the Use of Solvent-Detergent Plasma in Canada. March 2023. <https://nacblood.ca/en/resource/nac-recommendations-solvent-detergent-plasma-sd-plasma>.
- Chapter 19: Pathogen Reduced Platelets. Additional Resources for Psoralen treated platelets: Michelle Zeller, Shuoyan Ning, Amanda Nowry, Waseem Anani, Isabelle Blais-Normandin, Bryan Tordon
  - <https://professionaleducation.blood.ca/en/transfusion/clinical-guide/pathogen-reduced-platelets>
- ORBCon Pathogen Reduced Pooled Platelet presentation: Jeannie Callum
  - <https://transfusionontario.org/en/information-on-pathogen-reduced-pooled-platelets-presentation/>
- FAQ: Donor high titre isohemagglutinin testing at CBS: Marc Bienz, Melanie Bodnar, Gwen Clarke
  - <https://professionaleducation.blood.ca/en/transfusion/publications/faq-donor-high-titre-isohemagglutinin-anti-aanti-b-testing-canadian-blood>

# Clinical Guide to Transfusion – Chapter 19

## Pathogen-reduced platelets

**Learning objective:** Readers learn about manufacturing, component characteristics, and safety of pathogen-reduced platelets at Canadian Blood Services.

### Audience

- Transfusion health-care professionals

### Notable features

- Additional resource, including FAQ, slide decks and narrated video presentations, equip users to share information about pathogen-reduced platelets.

### Authors

- Isabelle Blais-Normandin, MD, FRCPC; Bryan Tordon, MD; Waseem Anani, MD; Shuoyan Ning, MD, FRCPC, DRCPSC

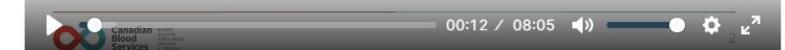
### Continuing education/professional development credits

- 2 credits, The Maintenance of Certification Program, Royal College of Physicians and Surgeons of Canada
- Non-verified activity for the Professional Enhancement Program, Canadian Society for Medical Laboratory Science



### Acronyms

Acronym	Name
PPPT	Pooled platelet psoralen-treated
APPT	Apheresis platelet psoralen-treated
PIT	Pathogen inactivation technology
PRT	Pathogen reduction technology
PAS	Platelet additive solution PAS-E is the formulation of PAS used at Canadian Blood Services



# Publications

## FAQ: Donor high titre isohemagglutinin (anti-A/anti-B) testing at Canadian Blood Services

**Learning objective:** Readers will learn about donor high titre anti-A and anti-B isohemagglutinin testing implemented in November 2022 at Canadian Blood Services.

### Audience

- Physicians, nurse practitioners, medical laboratory technologists in hospital laboratories

### Notable features

- Includes a downloadable slide deck describing testing and labeling, as well as details on distribution and use.

### Authors

- Melanie Bodnar, MD, FRCPC; Marc Bienz, MD, FRCPC; Gwen Clark, MD, FRCPC



# Publications

## FAQ: Whole blood, leukocytes reduced at Canadian Blood Services

**Learning objective:** Readers will learn about manufacturing, characteristics, benefits and risks of whole blood, leukocytes reduced, at Canadian Blood Services (currently available exclusively for military use).

### Audience

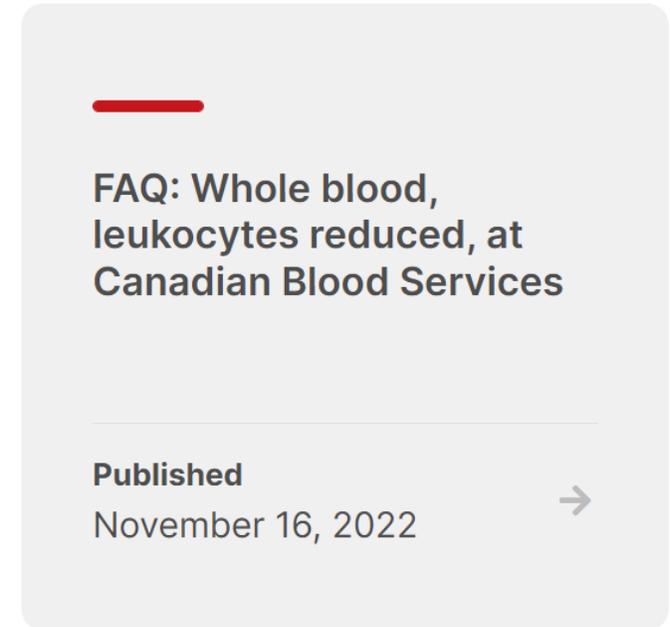
- Medical laboratory technologists, transfusion medicine physicians

### Notable features

- Table compares characteristics of LrWB with conventional blood components.
- Health-care providers in Canada are encouraged to share their perspectives on the use of LrWB in non-military settings by contacting your regional hospital liaison specialist.

### Authors

- Johnathan Mack, MD, MSc, FRCPC



FAQ: Whole blood, leukocytes reduced, at Canadian Blood Services

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