Saskatchewan Health Authority

PRAMS PROGRAM

Ensuring Best Practices in Expectant Patient and Post-partum Follow-up Care

TM SYMPOSIUM

16/SEP/25

Healthy People, Healthy Saskatchewan

The Saskatchewan Health Authority works in the spirit of truth and reconciliation, acknowledging Saskatchewan as the traditional territory of First Nations and Métis People.

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VISION, MISSION, VALUES AND PHILOSOPHY OF CARE

VISION

Healthy People, Healthy Saskatchewan

MISSION

We Care.
We work together to improve health and well-being; every day, for everyone.

VALUES

- **COMPASSION:** ***We are caring.*** We practice empathy. We listen actively to understand each other's experiences.
- **ACCOUNTABILITY:** ***We are responsible.*** We own each action and decision. We are transparent and have the courage to speak up.
- **RESPECT:** ***We are collaborative.*** We treat everyone with kindness, dignity, and empathy. We honour diversity and value each person as an individual.
- **EQUITY:** ***We are committed to health equity.*** We recognize that factors such as geographic location, culture, and background are key determinants of health outcomes. We embrace the diversity of our teams, and work to remove barriers to ensure all Saskatchewan residents and communities can access high-quality care.
- **SAFETY:** ***We are aware***. We commit to physical, psychological, social, cultural and environmental safety. Every day. For everyone.

PHILOSOPHY OF CARE: Our commitment to a philosophy of Patient and Family Centred Care is at the heart of everything we do and provides the foundation of our values.

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SHA Treaty Land Acknowledgement

Honouring Relationships with Indigenous People

We acknowledge that we are gathering on **Treaties 2, 4, 5, 6, 8 and 10 (Cree, Dené, Assiniboine/Nakota and Saulteaux) territories** and **the Homeland of the Dakota, Lakota and Métis**.

Recognizing this history is important to our future and our efforts to close the gap in health outcomes between Indigenous and non-Indigenous peoples by knowing what the land and the traditional people of the land offer us.

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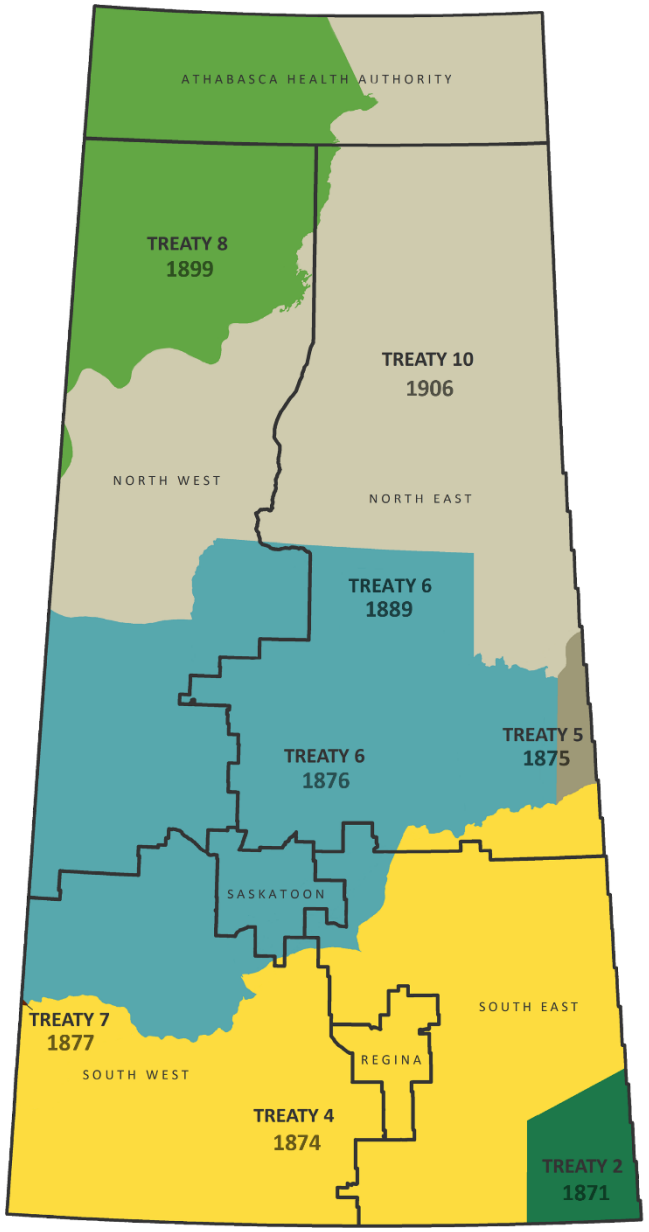
Treaty Territories and Saskatchewan Health Authority Areas

Depictions of Treaty boundaries are subject to variation. These boundaries are usually not surveyed and are estimated based on written descriptions.

This map displays the Pre-1975 Treaties (Historic Treaties) in colour, as provided by Crown-Indigenous Relations and Northern Affairs Canada.



DISCLOSURE

Presenter: Shaylyn Kraushaar/Sandy Holfeld

Relationships with financial sponsors:

- **Grants/Research Support:** none
- **Speakers Bureau/Honoraria:** none
- **Consulting Fees:** none
- **Patents:** none
- **Other:** none

OBJECTIVES

1.After active participation in this session, the participant will be able to define the roll of the PRAMS Nurse Coordinator.

2. Participant will understand the rationale behind pre-transfusion testing during pregnancy and its implications for fetus and pregnancy.

3. Participant will understand the mechanisms for prevention of D-alloimmunization and identify the clinical scenarios where Rh immune globulin is recommended.

4. After active participation in this session, the participant will be able to identify best practices for post-partum follow-up of Alloimmunized infants and mothers.

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PRAMS

What is PRAMS?

- Prevention of Alloimmunization In Mothers of Saskatchewan.

Who We Are?

- A working group of Transfusion Medicine physicians, Nurse Coordinators, MFM specialists, and Lab Specialists.

What We Are?

- A quality assurance program designed to streamline and ensure cohesive management of care for Rh negative and/or Alloimmunized pregnant women in Saskatchewan.

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PRAMS

OUR GOALS

LABS	• Ensuring consistent, timely Prenatal bloodwork and RhIg (WinRho©) administration across the SHA (routine prophylactic, postpartum, sensitizing events). • Ensuring follow up titers are being collected on Alloimmunized mothers as well as cord blood when required.
EDUCATION	• Providing educational materials to patients regarding both Rh negative pregnancies and/or Alloimmunization. • Providing continuing educational opportunities for nurses, physicians, NP's, midwives, etc.
REFERRALS	• Ensuring appropriate referrals to MFM's or OBS when required. • Ensuring newborn referral to Pediatric Hematology when required.

PRAMS

OUR DATABASE

- All prenatal bloodwork requisitioned in the province, utilizing the Saskatchewan prenatal requisition, is cc'd to the PRAMS program for verification and follow up of results.
- Utilizing the Accuro (EMR) program we have developed a series of tasks which populate according to each patient situation and gestational age.
- The main goal of the program is the prevention of HDFN (hemolytic disease of fetus and newborn).

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RH NEGATIVE PATIENTS

Ensure RhIg (WinRho©) administration throughout pregnancy at appropriate times:

- 28 week prophylactic dose.
- Any sensitizing event (trauma, bleeding in pregnancy, miscarriage, TOP, ECV).
- Delivery of a Rh positive baby or a baby of unknown Rh status.
- FMH/KB testing after sensitizing event/delivery after 20 weeks gestation.

RHIG DOSING/SCENARIOS

Table 1: List of sensitizing events for RhD negative peripartum patients necessitating WinRho® administration[2,8,9]

Delivery (by any method)	Spontaneous or therapeutic abortion (medical or surgical)
Antepartum hemorrhage	Ectopic pregnancy
Chorionic villus sampling	Abdominal trauma
Amniocentesis	External Cephalic version
Cordocentesis	Intrauterine Fetal Death

RHIG DOSING/SCENARIOS

Table 2: WinRho® dosing [Note: 1 mcg = 5 IU][2,8,9]

Clinical scenarios	Gestational age	WinRho® dose
Abortion - medical, surgical or spontaneous; CVS or amniocentesis less than 12 weeks	10 weeks to 11 weeks, 6 days	120 mcg*†
	12 weeks or more	300 mcg
Threatened abortion**	10 weeks to 11 weeks, 6 days	120 mcg*†
	12 weeks or more	300 mcg
Routine antenatal prophylaxis at 28 weeks	Approx. 28 weeks	300 mcg
Routine postpartum prophylaxis (If RhD positive neonate)**	At delivery	300 mcg
All other indications** (e.g., trauma, bleeding in pregnancy)	10 weeks to 11 weeks, 6 days	120 mcg*†
	12 weeks or more	300 mcg

† May hold WinRho® if there is confirmation of gestational age less than 10 weeks gestational age.
* If WinRho® 120 mcg is not stocked, administer 300 mcg. DO NOT split 300 mcg vials into smaller doses.
** FMH testing required at or after 20 weeks gestational age.

ALLOIMMUNIZED PATIENTS

- We follow any patient Alloimmunized to antibodies capable of causing HDFN throughout pregnancy and after delivery.
- Provide teaching documents to both the MRP and the patient regarding the antibody and what it means.
- Monitor Antibody titers during pregnancy.
- Ensure appropriate referral to MFM or Pediatric Hematology after delivery if needed.

Hemolytic Disease of the Fetus or Newborn (HDFN)

- During pregnancy, RBC's from the fetus can cross into the mother's bloodstream through the placenta. Sometimes the mother's body sees these RBC's as foreign and create antibodies against it.

- These antibodies attach the fetus' RBC's causing them to break down leading to fetal anemia, enlarged liver or spleen, newborn jaundice or hydrops.

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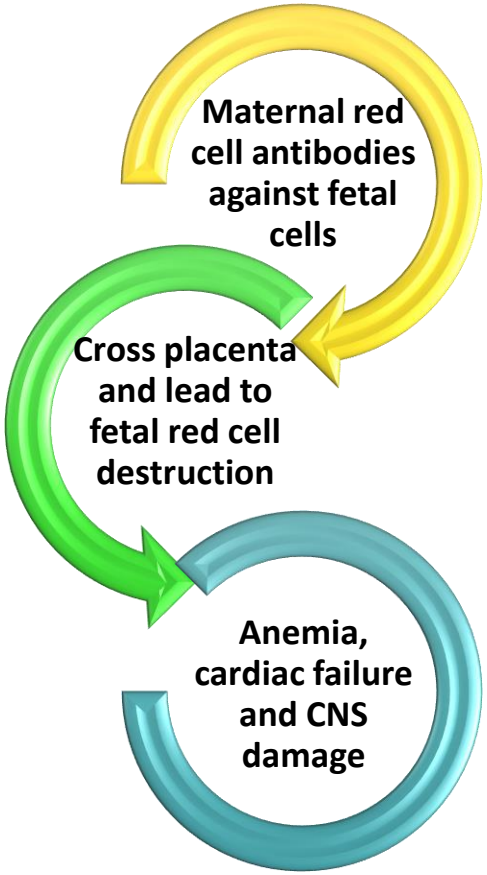
HDFN

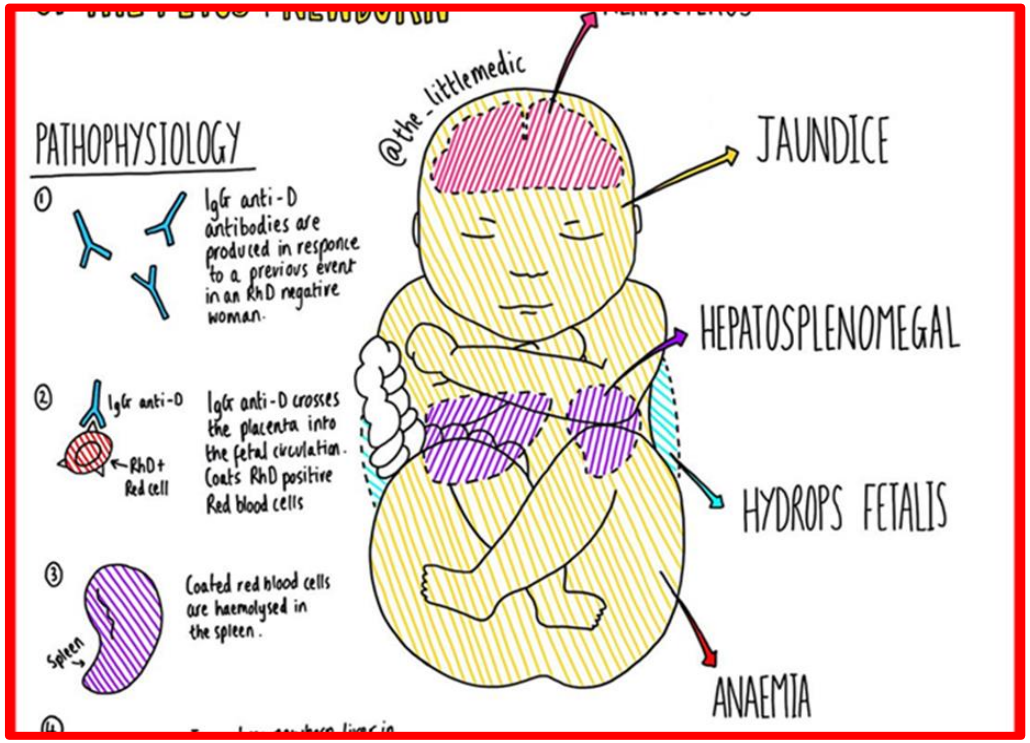


Vast Majority of still births or fetal anemia requiring intra-uterine transfusions occur due to

Anti-D

Anti-c (little)

Anti-Kell



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HDFN

Table 4. Clinically Significant Antibodies Associated with HDFN

Red cell antigen system[1, 2]	HDFN
Rhesus (D, C, c, E, e)	**YES.** Antibodies of the rh system can cause mild to severe HDFN
Kell	**YES.** Antibodies of the Kell system can cause severe HDFN. **Kell antibodies suppress erythropoiesis and can cause delayed anemia in infants up to 4 months of life.**
MNS	**YES.** Anti S, s and U can cause HDFN. **YES. Anti-M can suppress neonatal/fetal erythropoiesis and cause anemia up to of 4 months of life AT CRITICAL TITERS.** **NO.** Anti-N is not associated with HDFN.
Diego	**YES.** Anti Di, Di^b and Wr^a can cause HDFN of varying severity
Duffy	**YES.** Anti- Fy^a and Fy^b can both cause HDFN

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HDFN

Kidd	**YES.** Jk^a and Jk^b can both cause HDFN
Lutheran	**YES.** Lu^a and Lu^b can both cause HDFN
Lewis	**NO.** Antibodies against Lewis antigens are not associated with HDFN.
I	**NO.** Antibodies against I antigens (I and i) are not associated with HDFN.
P1	**NO.** Antibodies against P1 are not associated with HDFN.
HLA	**NO.** Not associated with HDFN.
ABO	**YES.** Can cause severe jaundice and anemia in neonates but not fetus. Only if mother is O

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ALLOIMMUNIZATION IN FETUS

HISTORY

- What Antibody is it?
- History of previously affected pregnancy?
- What is the titer level? (Critical=64, Kell critical at any level)
- Is there paternal testing?

ASSESSMENTS

- Bloodwork q2-8 weeks until delivery
- Once at a critical level, urgent referral to MFM
- MCA Doppler monitoring q 3 weeks from 16 weeks gestation
- Looking for signs of hydrops or anemia

TESTING

- Monitoring titer levels during the pregnancy
- cffDNA testing on certain antibodies to determine if fetus is negative or positive for the antigen
- Paternal testing

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SURVEILLANCE/TREATMENT

- MCA Doppler surveillance q2-3 weeks by MFM
- If dopplers suggest anemia patient will be sent for IUT (Intrauterine Transfusion) in Toronto or Winnipeg
- Continue IUT's usually q2-3 weeks until delivery
- IVIG
- Timely delivery

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NEWBORN FOLLOW UP

LABS

- Is Newborn positive for corresponding antigen?
- CBC, bili, retic count with cord blood
- Continue labs weekly for up to 4 months

REFERRALS

- Peds/Heme consult at delivery

TREATMENT

- Phototherapy
- Blood transfusion
- Exchange Transfusion
- IVIG

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NEAR MISS

DEFINITION:

- Prophylactic RhIg given between 30 weeks and delivery.
- RhIg after sensitizing event nearly missed
- Discharged home without postpartum RhIg but given within 28 days of delivery
- Near missed referral to MFM or Pediatric Hematology when required

EXAMPLES:

- Patients are between MRP’s at time when prophylactic RhIg is due.
- FMH misinterpreted after sensitizing event.
- Discharged without postpartum RhIg.
- Patient with critical titer not referred to MFM.
- Missed RhIg after loss

MISSES

DEFINITION:

- Prophylactic RhIg missed entirely
- Postpartum RhIg missed
- Missed/not completed titer levels

EXAMPLES:

- Patient refusal of RhIg (both prophylactic and postpartum)
- Limited PNC/no show for appointments therefore missing prophylactic RhIg.
- Missing prophylactic RhIg due to forest fires
- Late PNC, critical titer found at 35 weeks
- cffDNA cancelled

STATS FOR 2025

- **59** near misses/misses this year (missed proph. RhIg, missed pp RhIg, declining RhIg, missed MFM c/s, etc).
- **495** rejected samples this year.
- Currently following **830** Rh negative pregnant women in Saskatchewan
- **94** currently pregnant patients with antibodies (8 critical, 6 Kell)
- **21** critical/Kell deliveries thus far this year
- **7** cffDNA samples sent

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CLINICAL CASES

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CLINICAL CASES

Patient R.P.

- 2020 pregnancy – refused prophylactic and postpartum RhIg for personal reasons.
- Developed immune Anti-D – critical titer > 512 at 20w6d during next pregnancy
- Monitored by MFM (MCA dopplers)
- Received 3 IUT's in Toronto
- After delivery Newborn received both IVIG and phototherapy for severe hyperbilirubemia, and Blood transfusion x 2 for anemia.
- **Most recent pregnancy(2024):** IVIG since 16 weeks, no IUT needed. Baby still required IVIG, phototherapy and transfusion.

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CLINICAL CASES

Patient B.B.

- Anti-Kell twin pregnancy
- Partner tested Kell heterozygous positive (50% chance of being Kell pos)
- cffDNA testing done - predicted one or more fetuses are Kell positive
- Monitored with MCA dopplers (no IUT req'd)
- Cord blood – both twins Kell pos, DAT positive.
- Treated with phototherapy for jaundice
- No transfusions required

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CLINICAL CASES

T.P. – Anti- Fyb

- Initial Prenatal Screen done in pregnancy showed she was Rh positive with a negative antibody screen. No further samples req'd.
- G&S at time of delivery was shown to have developed Anti-Fyb with a titer of >512
- Cord blood – Baby tested positive for Fyb Antigen with a Positive DAT
- Ensured Peds Heme referral made by MRP
- Ongoing anemia – rec'd blood transfusion at 7 weeks of age

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PRAMS CONTACT INFO

SaskBlood – PRAMS Website
http://saskblood.ca/prams-program/

https://momsandkidssask.saskhealthauthority.ca/

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QUESTIONS?

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