The Office of Lifelong Learning & the Physician Learning Program

Postpartum Hemorrhage: No Denial, No Delay
The Alberta Interprofessional Toolkit | Pearls for practice

Dr. Stephanie Cooper, Dr. Giselle DeVetten, Dr Colin Birch, Dr Robert Thompson, Dr. Phillipa Brain, Jaclyn Zakresky, Katie Richardson

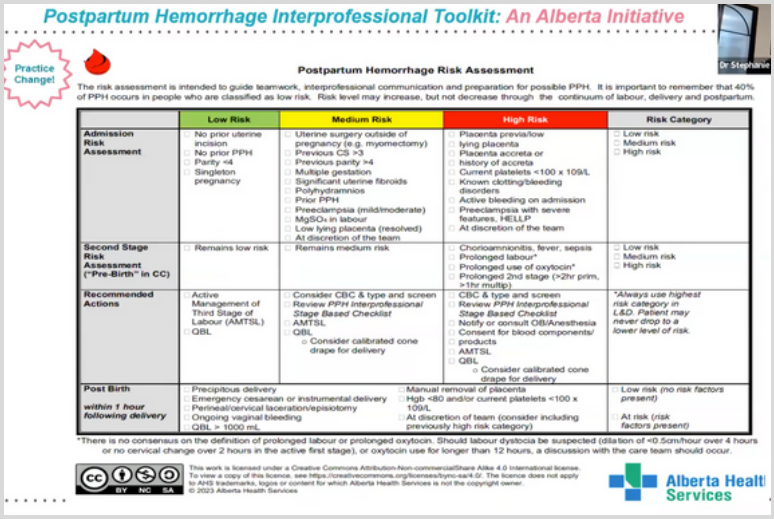
Obstetric Hemorrhage

- Leading cause of mortality world-wide
- Most preventable cause of maternal mortality
- Large scale quality improvement programs have reduced both maternal morbidity and mortality
- 21% increase in PPH in Canada from 2003-2010
- In Alberta from 2015 to 2022, PPH was reported in 11.9% of deliveries
- Lack of appropriate attention to clinical signs is the leading cause in delay
- CMQCC developed a Obstetrical hemorrhage Toolkit https://www.cmqcc.com

- Goal:
  - early identification for people at risk for PPH and also for those having a PPH
  - Implement a standardized timely response
  - No Denial, No Delay

1.Assess and identify hemorrhage risk for every woman antepartum, throughout L&D, & PP

- enhances early recognition of hemorrhage
- allows increased surveillance
- increases use of preventative measures
- initiates an early, aggressive response to bleeding
  - Main et. al Obstet Gynecol 2015:202:363



Postpartum Hemorrhage Interprofessional Toolkit: An Alberta Initiative

Practice Change!

Postpartum Hemorrhage Risk Assessment

The risk assessment is intended to guide teamwork, interprofessional communication and preparation for possible PPH. It is important to remember that 40% of PPH occurs in people who are classified as low risk. Risk level may increase, but not decrease through the continuum of labour, delivery and postpartum.

	Low Risk	Medium Risk	High Risk	Risk Category
Admission Risk Assessment	☐ No prior uterine incision ☐ No prior PPH ☐ Parity <4 ☐ Singleton pregnancy	☐ Uterine surgery outside of pregnancy (e.g. myomectomy) ☐ Previous CS >3 ☐ Previous parity >4 ☐ Multiple gestation ☐ Significant uterine fibroids ☐ Polyhydramnios ☐ Prior PPH ☐ Preeclampsia (mild/moderate) ☐ MgSO4 in labour ☐ Low lying placenta (resolved) ☐ At discretion of the team	☐ Placenta previa/low lying placenta ☐ Placenta accreta or history of accreta ☐ Current platelets <100 x 109/L ☐ Known clotting/bleeding disorders ☐ Active bleeding on admission ☐ Preeclampsia with severe features, HELLP ☐ At discretion of the team	☐ Low risk ☐ Medium risk ☐ High risk
Second Stage Risk Assessment ("Pre-Birth" in CC)	☐ Remains low risk	☐ Remains medium risk	☐ Chorioamnionitis, fever, sepsis ☐ Prolonged labour* ☐ Prolonged use of oxytocin* ☐ Prolonged 2nd stage (>2hr prim, >1hr multip)	☐ Low risk ☐ Medium risk ☐ High risk
Recommended Actions	☐ Active Management of Third Stage of Labour (AMTSL) ☐ QBL	☐ Consider CBC & type and screen ☐ Review *PPH Interprofessional Stage Based Checklist* ☐ AMTSL ☐ QBL ☐ Consider calibrated cone drape for delivery	☐ CBC & type and screen ☐ Review *PPH Interprofessional Stage Based Checklist* ☐ Notify or consult OB/Anesthesia ☐ Consent for blood components/ products ☐ AMTSL ☐ QBL ☐ Consider calibrated cone drape for delivery	**Always use highest risk category in L&D. Patient may never drop to a lower level of risk.*
Post Birth *within 1 hour following delivery*	☐ Precipitous delivery ☐ Emergency cesarean or instrumental delivery ☐ Perineal/cervical laceration/episiotomy ☐ Ongoing vaginal bleeding ☐ QBL > 1000 mL	☐ Manual removal of placenta ☐ Hgb <80 and/or current platelets <100 x 109/L ☐ At discretion of team (consider including previously high risk category)		☐ Low risk *(no risk factors present)* ☐ At risk *(risk factors present)*

*There is no consensus on the definition of prolonged labour or prolonged oxytocin. Should labour dystocia be suspected (dilation of <0.5cm/hour over 4 hours or no cervical change over 2 hours in the active first stage), or oxytocin use for longer than 12 hours, a discussion with the care team should occur.

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Alberta Health Services

2.Recognize, assess and treat: classify PPH by stage

- measure and report cumulative quantifiable blood loss (QBL)
- use stage-based checklists: meds, fluids, escalation, blood products etc

Principles:

- use quantitative, cumulative blood loss AND clinical findings to determine severity of blood loss
- maternal tachycardia usually precedes other signs and symptoms
- hypotension can be a late sign
- consider rate of bleeding and ongoing vs settled

Do Not relay on hemoglobin/HCT as an indicator to treat!

Classification of Primary PPH by Stage

Pregnant patients may maintain normal vital signs (VS) despite significant blood loss. Do not delay appropriate treatment if significant blood loss has occurred and ongoing bleeding continues - even if VS remain in normal range

	Cumulative Quantitative Blood Loss (QBL)	Blood Pressure (BP)	Heart Rate (HR)	Signs & Symptoms
Stage 0	<500 mL for vaginal birth <1000 mL for C/S	Normal	<100 bpm	Often asymptomatic
Stage 1 (mild)	>500 mL for vaginal birth >1000 mL for C/S	Normal	<110 bpm	Often asymptomatic or may have signs & symptoms of severe PPH (see below)
Stage 2 (moderate)	1000-1500 mL	Postural hypotension, mild decrease in systolic (80-100 mmHg)	>110 bpm	Often asymptomatic or may have signs & symptoms of severe PPH (see below)
Stage 3 (severe)	>1500 mL	Significant decrease in systolic BP (70-80 mmHg)	>120 bpm	- Diaphoresis - Delayed capillary refill time - Tachypnea - Pallor - Anuria/Oliguria - Decreased LOC - Agitation

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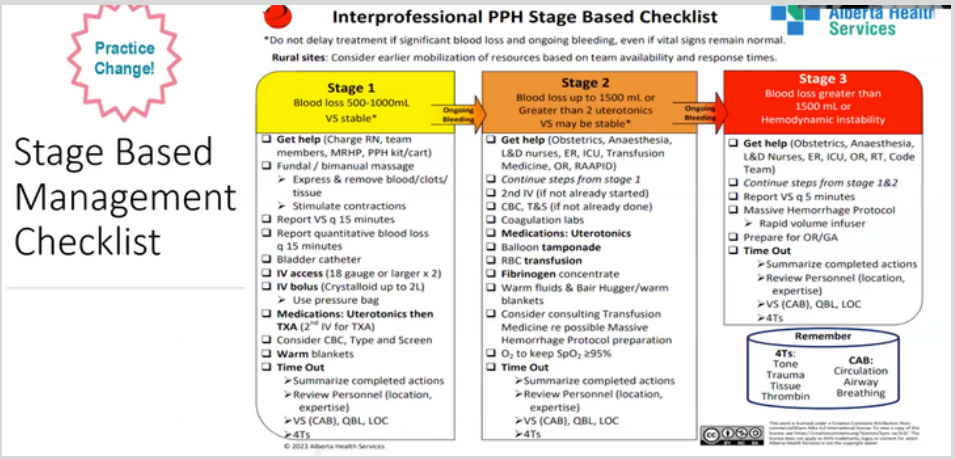
Use of Interprofessional PPH Stage Based Checklist

- Performing critical tasks the same way each time can reduce human error (especially w/stress and fatigue)
- Protocols and check-sheets have been shown to reduce harm and improve outcomes in medical care (ACOG Committee Opinion 629)



What is new for treatment

- IV Oxytocin dose change for Active management of the third stage of labour (ATMSL) - cardiovascular risk
- Carbetocin for AMTSL can be used for high risk vaginal deliveries
- Misoprostol Route- PR is not effective!!

Things to Consider:

- Onset of misoprostol is slow-do not delay a second line uterotonic waiting for it to work if actively bleeding
- Ergonovine (Ergot) is a 2nd agent of choice
- If you are giving TXA IVPB, have another IV line to give fluids

3. Debrief after every PPH

- Learn from experience, reinforce all that went well
- Discuss areas in need of improvement
- Share lessons learned
- Highlight system issues for planning and potential solutions

4.Perform regular simulations and drills

- review and reinforce team's roles and responsibilities
- identify correctable system issues
- practice important team-related and communication skills

PPH Meds	Dose, Route & Frequency	Onset & Duration of Action	Side Effects	Contraindications (CI) and Cautions
Active Management of Third Stage of Labour				
Oxytocin (Syntocinon)	10 units IM with anterior shoulder OR Infuse 20-40 units/L at 150mL/hr OR 3 units diluted in 3mL slow IV (over 60 seconds) with anterior shoulder	Onset: 3-7 min Duration: 1-2 hours Onset:1-2 min Duration: 15-20 minutes	Minimal side effects if given slowly (IV) If given quickly (IV only): Hypotension, hypertension, increased heart rate, ST depression	Caution: Cardiovascular changes more likely with rapid IV
Carbetocin (Duratocin) (For any Cesarean Delivery or for vaginal delivery at high risk for PPH)	100 mcg IM OR IV direct over 60 seconds	Onset: 3-4 min Onset: 1-2 min Duration (all routes): 1 hour	Similar to oxytocin: Hypotension, flushing, headache, pruritus, abdominal pain, nausea, vomiting, tremor	Caution in cardiovascular disease, migraine, epilepsy, or asthma
First Line Treatment				
Oxytocin (Syntocinon)	20-40U/1L NS/RL; 500 mL bolus Once bolus complete, infuse at 150 mL/hour	Onset: 4 min Duration: ongoing	Usually None. Nausea, vomiting, hyponatremia with prolonged IV administration. Decreased BP and increased HR with high doses.	Contraindication: Hypersensitivity to drug Caution: Can cause water retention
Ergonovine (Ergot)	250 mcg (0.25 mg) IM *Do NOT give IV* Q 2-4h (*more than 2 doses requires consultation with OB specialist*)	Onset: 2-5 min Duration: 2 hours	Nausea, vomiting, vasoconstriction, severe hypertension, ST depression	Contraindication: Hypertension, hypersensitivity to drug. Caution: in conjunction with ephedrine may exaggerate hypertensive response with risk for cerebral hemorrhage. Risk of hypertension and stroke increased with IV administration.
Second Line Treatment				
Tranexamic Acid (TXA) (Cyclokapron)	1 g/100 ml NS IV over 10 min – max rate 100mg/min (do not interrupt uterotonics. Need second IV access). If significant bleeding continues, may repeat after 30 minutes, maximum 2 doses	Onset: Few minutes Duration: >2 hours	Headache, abdominal pain, arthralgia, anemia, Nausea, vomiting	Contraindication: Hypersensitivity to drug active thromboembolic disease (DVT, PE)
Carboprost (Hemabate)	250 mcg (0.25 mg) IM or IMM Repeat q 15 minutes.	Onset: 2-5 min Duration: 60 min	Nausea, vomiting, diarrhea, fever, headache, chills,	Caution: with hepatic disease or asthma. Consider: concurrent loperamide.

5. Report and review of adverse events

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Anemia in Pregnancy- Why it Matters

Iron Deficiency Anemia – risk to mother and fetus

- Fatigue
- Mood concerns
- IUFD
- Increased risk of c-section.
- Preterm Delivery
- SGA / low birthweight baby
- Abruption
- Increased risk of blood transfusion
- Neonatal – iron deficiency +/- anemia
- Neonatal – potential long term cognitive/motor/memory issues
- Maternal mortality

B12 Deficiency – risk to mother and fetus

- Fatigue
- Neural tube defects
- Preterm delivery
- SGA / low birthweight baby
- Infections
- Neonatal – B12 deficiency
- Neonatal – potential cognitive issues, developmental regression

Definitions in Pregnancy

- **Anemia:** Hb <110 g/L
- **Iron deficiency** : Ferritin <30 ug/L or Transferrin Sat <15%
- **Iron deficiency anemia:** Hb <110 g/L and Ferritin <30 ug/L
- **Severe IDA:** Hb <80 g/L and Ferritin <30 ug/L
- **Vitamin B12 deficiency:** B12 <220 pmol/L

Optimizing Oral Iron Treatment

Improving oral iron absorption

- Take iron in morning, on an empty stomach with vitamin C 250 mg to enhance absorption
- Avoid taking iron with calcium (supplements or foods), antacids, thyroxine (Synthroid®), PPI's/H2 antagonists, coffee, tea, soy, or eggs (within 1 hour)
- Take it every other day or Mon/Wed/Fri mornings

Improving tolerance of oral iron

- Start with a low dose and titrate slowly
- Consider intermittent (every other day) iron supplementation
- Consider powdered or liquid formulations to allow for smaller dose titrations
- Take with small snack or at bedtime (may reduce absorption)
- Consider polysaccharide iron complex as may have improved tolerability (however significantly increased cost)
- Counsel on constipation prevention

Treatment Oral Iron

- Dosing
  - Daily vs intermittent
- Morning, empty stomach, no meds
- Type
  - Ferrous salts (sulphate, fumarate, gluconate)
  - Polysaccharide iron complex and heme iron
- Duration
  - Remain on oral iron for duration of pregnancy and at least 6-12 weeks post-partum (if tolerated)
- Patient engagement and empowerment
  - Handout
  - Nutrition class +/- Dietitian referral

Follow-up

ASK, ASK, ASK!!!

- Ask patients about their iron supplements
  - how/when they are taking it
  - any side effects?
  - are they feeling better?
  - do they need refills?
- Review recommendation duration
- Repeat CBC and Ferritin in 4 weeks

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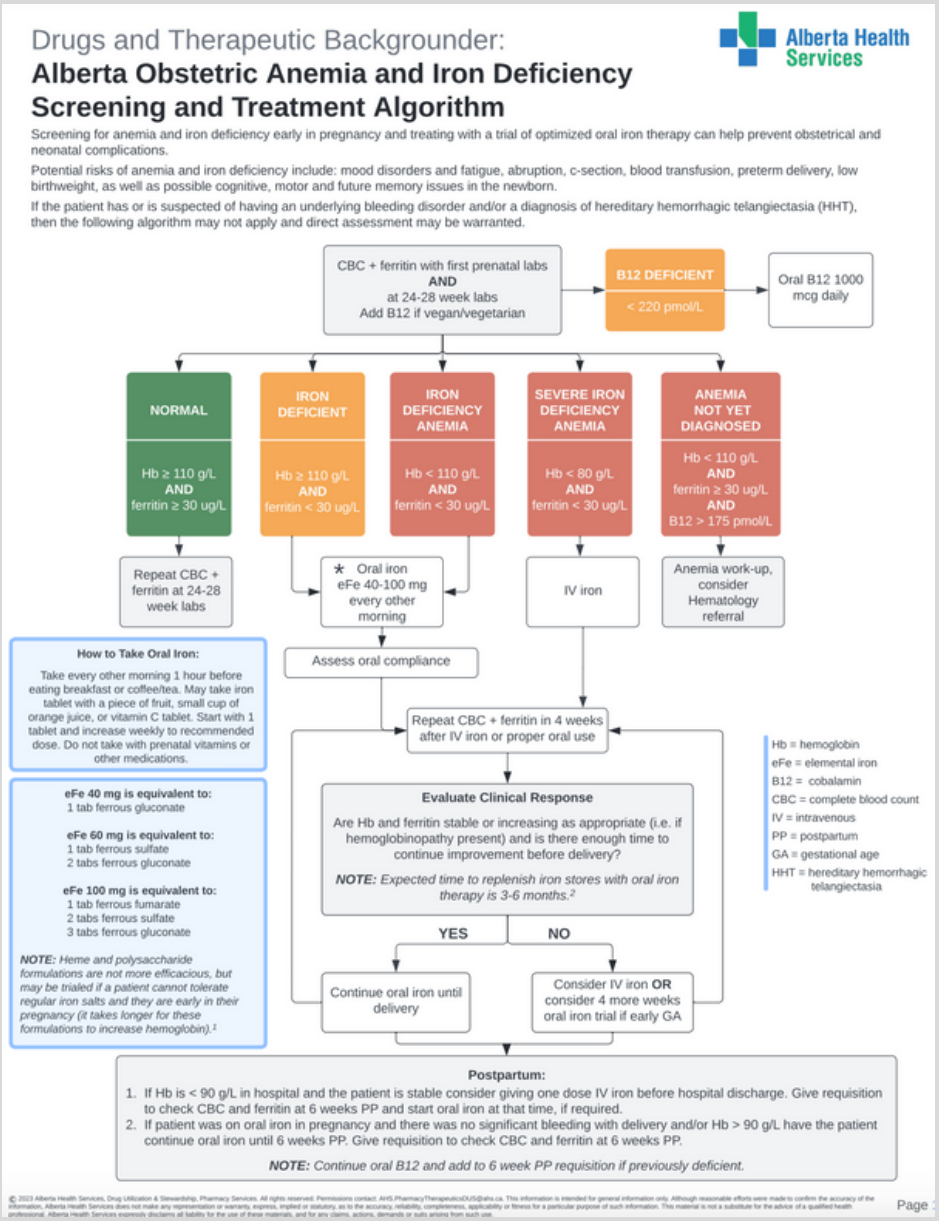
Consider IV Iron

- Severe anemia
  - Hb <80 g/L and Ferritin <30 ug/L
- Failed a **correct tria**l of oral iron
  - Hemoglobin increase of <10 g/L in 4w
- Iron deficiency anemia diagnosis at >34 week GA
  - Hb <110 g/L and Ferritin <30 ug/L
- Unable to tolerate oral iron
- Unable to absorb oral iron
  - clinically active IBD, bariatric surgery, etc.



Drugs and Therapeutic Backgrounder:

Alberta Obstetric Anemia and Iron Deficiency Screening and Treatment Algorithm

Alberta Health Services

Screening for anemia and iron deficiency early in pregnancy and treating with a trial of optimized oral iron therapy can help prevent obstetrical and neonatal complications.

Potential risks of anemia and iron deficiency include: mood disorders and fatigue, abruption, c-section, blood transfusion, preterm delivery, low birthweight, as well as possible cognitive, motor and future memory issues in the newborn.

If the patient has or is suspected of having an underlying bleeding disorder and/or a diagnosis of hereditary hemorrhagic telangiectasia (HHT), then the following algorithm may not apply and direct assessment may be warranted.

Resource: **Anemia and iron deficiency in pregnancy Backgrounder AHS**