ACLS and Emergency Response in the Pregnant Patient
September 14, 2018

Review Code OB and Emergency Response Plan from CCTC "protocols" for "obstetrics".

Emergency Response for the Critically Ill Obstetrical Patient
Critical Care Trauma Center, Victoria Hospital

A separate Code OB – University Hospital is under development and will be based on site specific resources. The process for obstetrical response is currently in the process of review and is subject to change. To ensure the most up-to-date information, always obtain the guidelines and checklists from the CCTC website; the last date of revision is identified on the bottom of the page. The link is located under "P" for Pregnancy on the Protocols page:
http://www.lhsc.on.ca/Health_Professionals/CCTC/protocols/index.htm

Maternal Cardiac Arrest:
In maternal cardiac arrest where there is a "visibly gravid uterus" that is large enough to potentially cause vena caval compression (with viable or non-viable), emergency cesarean section should be performed within 4 minutes if there is no return of circulation. The primary purpose is to facilitate effective maternal CPR/circulation.

CPR should be performed with hands positioned mid sternal (more cephalic than conventional CPR), with uterine displacement position (wedge under right hip, tilted toward left). If the patient is receiving magnesium sulphate at the time of cardiac arrest, the infusion should be stopped and 10 ml of calcium chloride 10% or 20 ml calcium gluconate 10% administered.

Causes for the cardiac arrest should be sought out and treated, using the BEAU-CHOPS mnemonic: (**B**leeding, **E**mbolism (coronary/pulmonary/amniotic), **A**nesthetic complications, **U**terine atony, **C**ardiac disease (MI/ischmia/aortic dissection/cardiomyopathy), **H**ypertension/preeclampsia/eclampsia, **O**ther: differential diagnosis per standard ACLS guidlelines, **P**lacenta (abruption/previa), or **S**epsis.

Emergency responses are divided into 3 situations below:

1. Code OB: where both maternal and neonatal resuscitation/emergency response is needed.
2. Emergency obstetrical response where neonatal resuscitation is not a consideration.
3. Massive Transfusion Pathway (may require activation in either situation 1 or 2 above).

1. **CODE OB:**
   Code OB is indicated when a multidisciplinary team is needed urgently, to respond to a life-

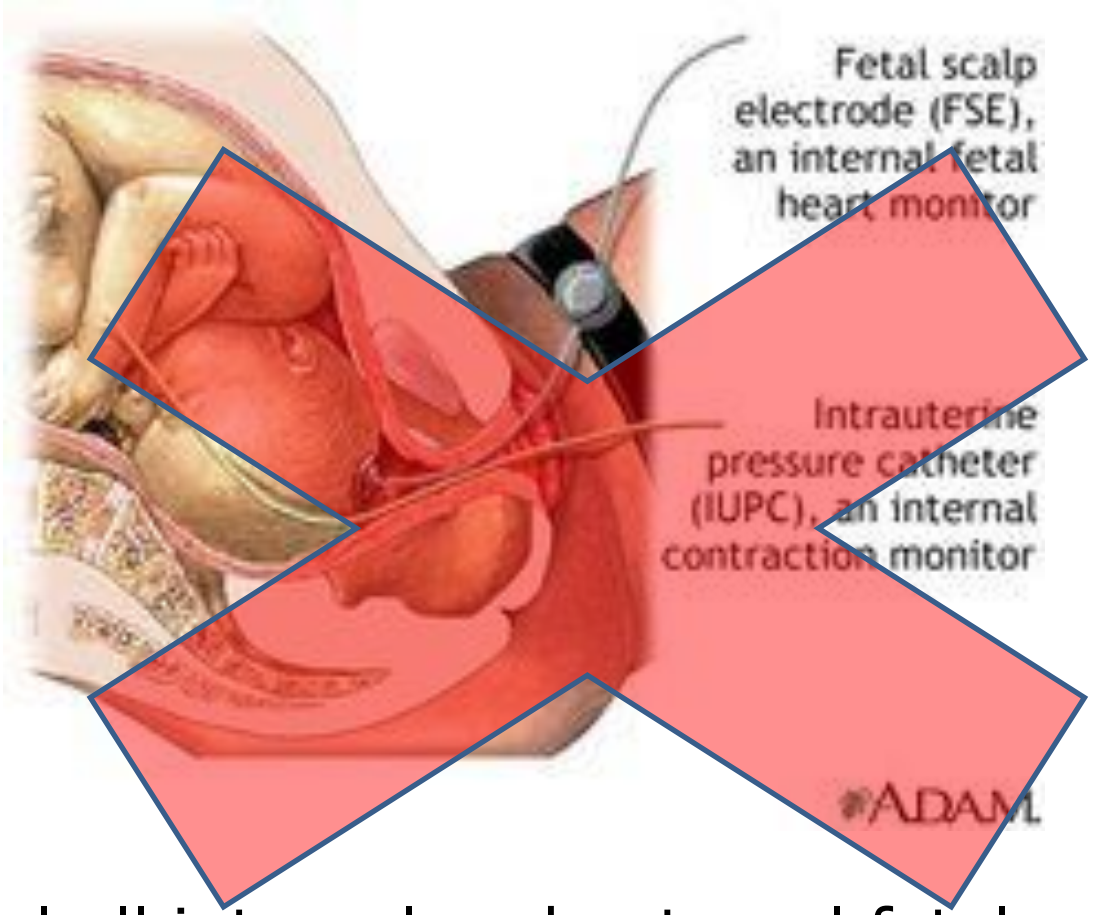
BE PREPARED

- Q SHIFT:
  - Review daily checklist
  - Ensure all emergency equipment is available
  - Review neonatal equipment with PCCU and NICU teams each shift
  - Review emergency responses (CNs, RRTs, Unit Clerk, all nurses in the same Bay) each shift
  - Know how and when a CODE OB is indicated

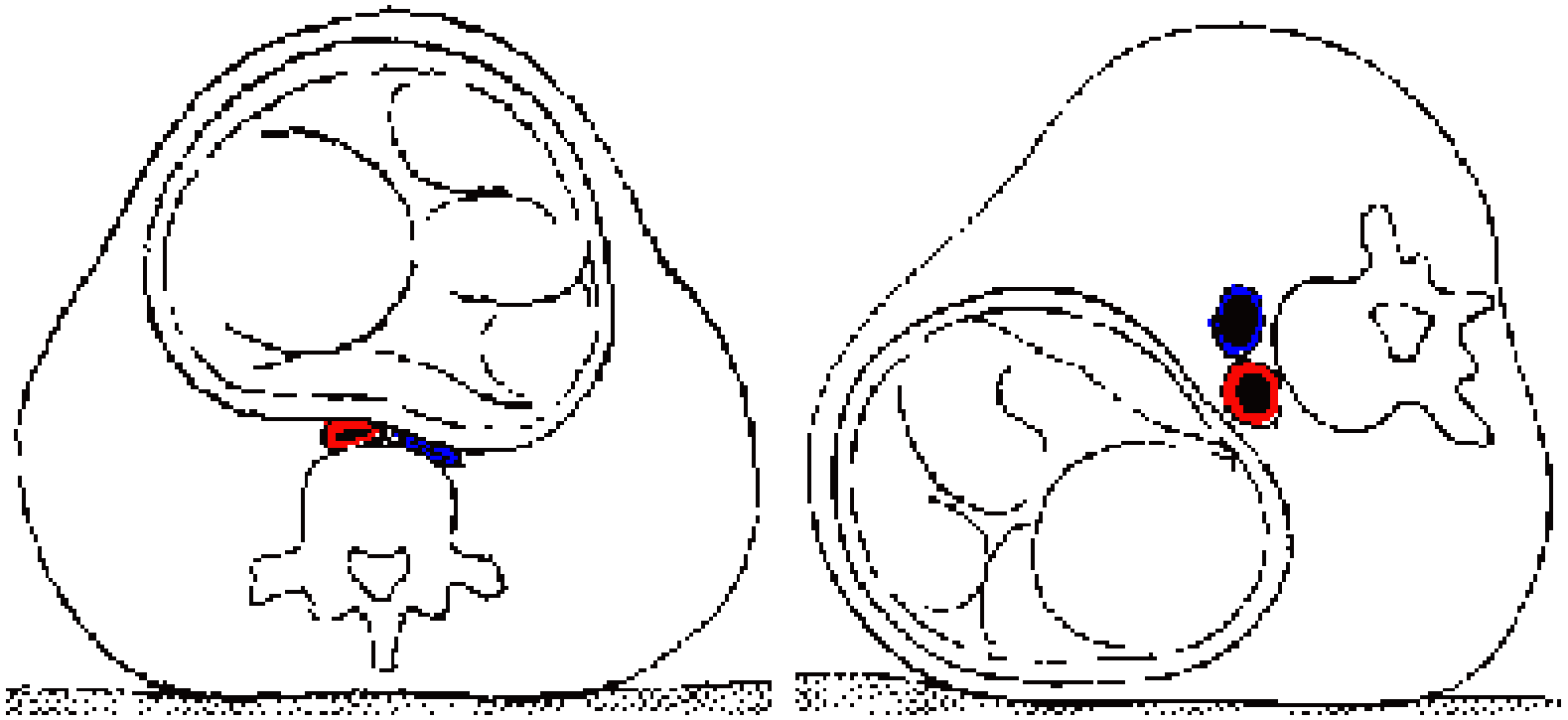
ACLS Modifications

- Anticipate rapid respiratory decline and difficult airway
- Provide 100% oxygen early
- Page **OB-Anaesthesia** STAT; intubation by OB anaesthesia
- IV therapy above the diaphragm
- Hand positions THE SAME AS NON-PREGNANT
- Manual left uterine displacement by assistant
- Remove internal and external fetal monitoring
- Stop Mg S04 infusion and consider calcium chloride administration (if MgS04 used)
- Perimortem C section at 4 minutes if no ROSC (primary goal maternal survival)
- Standard ACLS medication and cardioversion protocols
- Consider “BEAU CHOPS”
- Primary goal is saving mother

Hand position **the same for non-pregnant**. It is no longer recommended to move the hands more cephalic.



Removal all internal and external fetal monitors at the onset of maternal cardiac arrest



If uterus is at or above the umbilicus, supine positioning can cause caval and aortic compression with reduced cardiac output. A left manual uterine displacement technique (next slides) should be performed by an assistant during CPR (2015 ACLS guidelines have removed the recommendation for lateral bed rotation during CPR due to diminished compression effectiveness).

1. With patient supine, one healthcare provider standing on the right hand side of the patient applies leftward uterus displacement with ONE hand.

2. With patient supine, one healthcare provider standing on the left hand side of the patient displaces the uterus toward the left usingTWO hands.

If a patient arrests while receiving magnesium sulphate, calcium chloride administration should be considered.

Follow all other ACLS protocols for cardioversion, defibrillation and medications. The mother is always the priority.

Caesarean delivery should be performed at 4 minutes if no ROSC for any woman with a visibly pregnant abdomen. The purpose of the emergency delivery is to facilitate CPR; the primary goal is maternal survival.

Fetal outcomes may be better if Caesarean is performed at the onset of maternal decompensation.

An emergency Caesarean can be performed if only a scalpel is available, however, a Caesarean tray is maintained at the bedside.

As soon as a maternal emergency is identified, turn on the infant warmer (manual). PCCOT and NICU should review the setup at the start of each shift with assigned RN to familiarize themselves with available equipment and expectations.

CODE OB brings both PCCU and NICU teams; PCCU arrives first and is relieved by NICU upon their arrival.

Neonatal Resuscitation

- Warm:
  - Turn warmer onto 50% manual as soon as maternal emergency identified
  - Upon birth, skin probe must be applied to neonate and warmer mode changed to “baby” or “servo” mode. This adjusts warmer temperature to neonate’s skin temperature to prevent neonatal over heating

Oxygen and ventilation equipment should be reviewed by the NICU or PCCU RRT.

Neonate <24-28 weeks gestation will be placed WET into food grade plastic bag to maintain heat

Neonatal Resuscitation

- Position airway into a sniffing position (don't hyperextend neck)
- Suction (80-100 mmHg)
  - Mouth before Nose
- Dry and stimulate
- Bag/mask ventilation (puffs) (initial resuscitation on **ROOM AIR**)
- Keep baby below unclamped placenta (to prevent neonatal blood loss)

In addition to standard H's and T's, if no ROSC, consider "BEAUCHOPS" for possible causes of maternal cardiac arrest:

- **B** Bleeding/DIC
- **E** Embolism cardiac/pulmonary/amniotic fluid
- **A** Anaesthetic complications
- **U** Uterine atony
- **C** Cardiac disease: MI/ischemia/aortic dissection/cardiomyopathy
- **H** Hypertension/preeclampsia/eclampsia
- **O** Review standard ACLS guidelines (Hs and Ts)
- **P** Placental abruptio, previa
- **S** Sepsis

The Five T's (Causes for Post Partum Hemorrhage)

- Tone: uterine atony
- Tissue: retained placenta
- Trauma: uterine, vaginal
- Thrombin: massive transfusion with clotting factor deficiency,
- Therapeutic anticoagulation

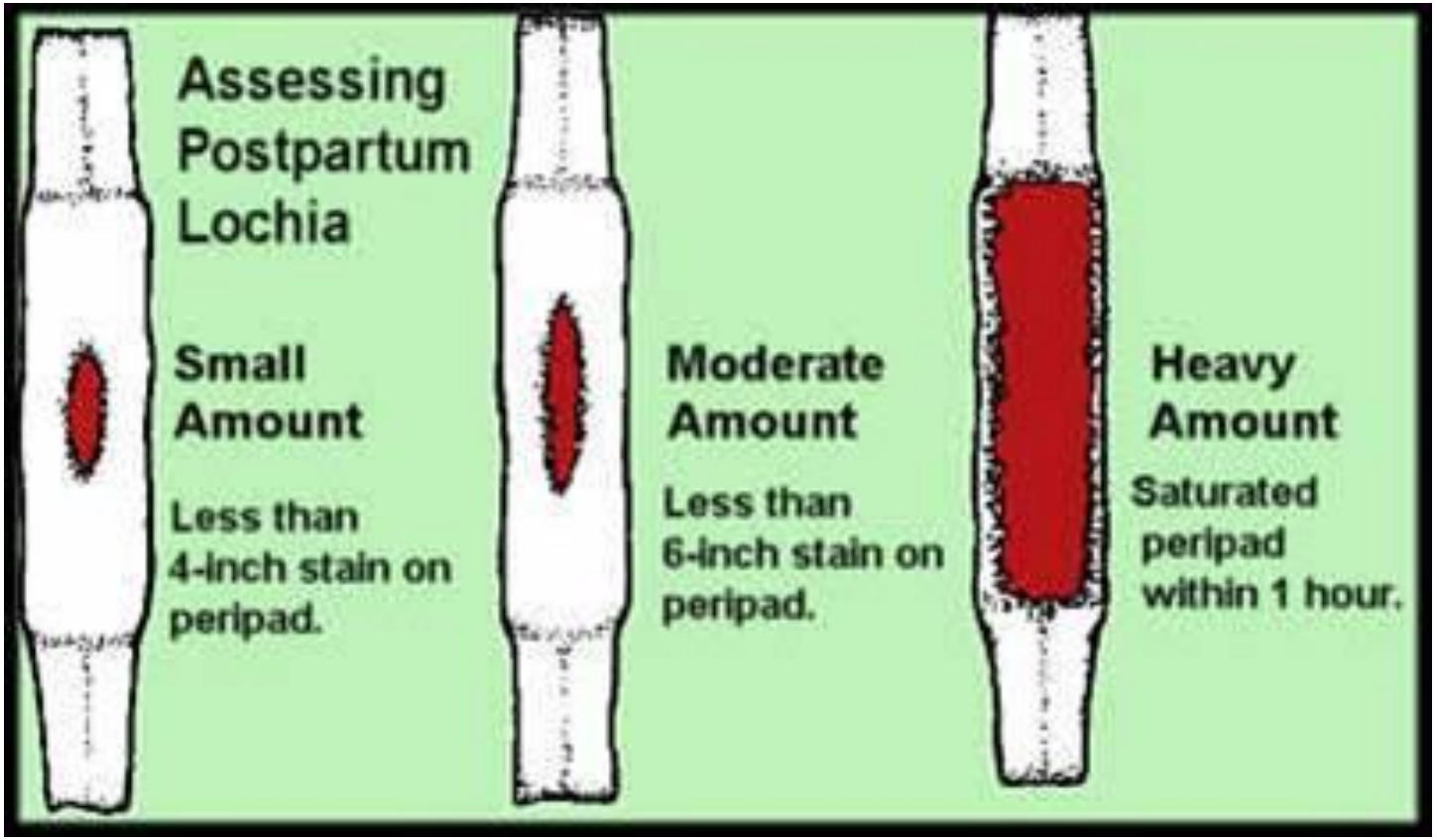
Recognition of PPH (SOGC, 2008)

Blood Loss	SBP	Signs/ Symptoms	Shock
500-1000ml (10-15%)	Normal	↑ HR, palpitations Dizziness	Compensated
1000-1500ml (15-25%)	Slight ↓	Diaphoresis ↑cap refill Cool extremities Anxiety	Mild
1500-2000ml (25-35%)	70-80 mmHg	↑ RR Postural Hypotension Oliguria	Moderate
2000-3000ml (35-45%)	50-70 mmHg	Hypotension Altered LOC	Severe

By the time that BP drops, blood loss is > 1500 ml. Funus and flow are the two most important assessments for early detection.

Assessment for PPH

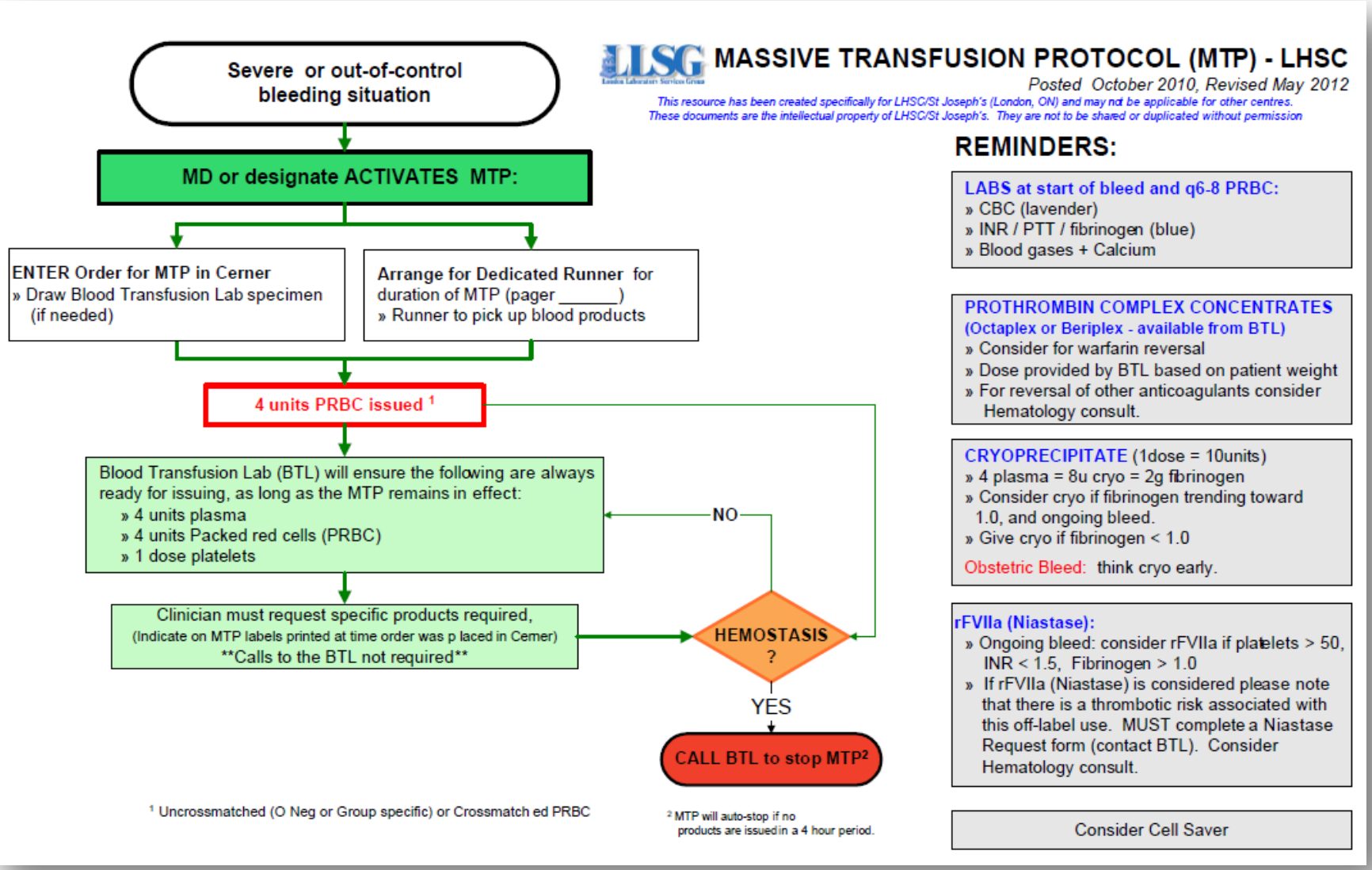
- Fundus and flow q15 minutes in 1st hour (this is earlier finding than hypotension)
- CBC, INR/PTT and **fibrinogen**



PPH medications

Medication	Dose	Contraindications	Actions
Oxytocin	10 IU IM 20 U in 1000 @ 125ml/hour	none	Contraction of upper segment of myometrium
Methylergonovine	.2 mg IM (q 2-4 hours)	Hypertension, toxemia, sepsis, hepatic or renal disease	Vasoconstriction
Carboprost (Hemabate)	0.25 mg. IM or IMM repeated q15 – 30 minutes for total of 2 mg.	Active pulmonary, renal, hepatic or cardiac disease	Improves uterine contractility
Misoprostil	200 – 600 ug p.o. or 200 – 1000 ug pr	Caution: cardiovascular disease	Smooth muscle contraction

Bags of Oxytocin kept in fridge in OBCU. Upon admission of pregnant/post partum patient to CCTC, obtain two bags and keep in fridge near patient Bay.



Assign a runner to obtain blood products. Measure and consider fibrinogen administration (cryoprecipitate) early in PPH. A low fibrinogen can make INR and PTT measurement difficult; consider low fibrinogen as cause if INR/PTT cannot be measured by lab.