OB Massive Transfusion Protocol

Presented by:

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Postpartum Hemorrhage (PPH)

- A leading cause of maternal morbidity worldwide
- Can occur up to 24 hours after delivery
- Rate of occurrence
  - PPH occurs in ~5% of singleton deliveries
  - Massive PPH occurs in ~ 0.2% of all pregnancies

Why PPH can be so massive

- Uteroplacental circulation is 700 mL of blood per minute.
- Patient can loose 2-3 liters of blood in a matter of minutes
- Any interruption of normal hemostasis can result in life threatening maternal hemorrhage

Risk Factor for PPH

- Uterine atony unresponsive to uterotonic agents (Oxytocin)
- Abnormal placental implantation
- Retained products of conception
- Uterine rupture
- Birth trauma
- Existing acquired coagulopathy
- Twin pregnancy

SMMC - 2007

- SMMC 2007 = 3000 deliveries (8-9 /day)
  - Rate of PPH = 5% = 50 per year
  - Rate of massive PPH = 0.2% = 6 per year
- 3 acute PPH transfusions in last 6 months
- Last Case – Placenta Previa
  - Transfused 10 RBC, 4 Plasma, 2 Plts

2007 – No MTP

- SMMC had no standard protocol
- Confusion & ineffective communication
  - 4-5 phone calls in first 10 minutes from floor
  - Confusion in orders
  - Floor wanted Blood Bank to deliver blood
  - Blood Bank did not have security to enter LDRP, C-Section rooms or NICU
  - Floor staff didn't know where Blood Bank was
  - Result was delay in getting blood to patient
    - 2 unit uncrossmatched RBCs issued in ~ 15 minutes
    - FFP/Plasma issued in ~30 minutes

Need for MTP

- Goal – to develop
  - A standardized protocol
  - Rapid, early & effective communication
  - Intervention to optimize patient outcome

MTP Team - Multiple Disciplines

- Blood Bank Medical Director & Lead Tech
- Laboratory Manager
- OB Physician
- OB Hospitalist
- Anesthesiologist
- Perinatologist
- Neonatologist
- Pharmacy Manager
- LDRP Nurse Manager and Staff

MTP Developed

- Timeline:
  - Developed in 6 months - Jan to June 2008
  - Inserviced - Nursing & Blood Bank July 2008
  - Drills - August 2008
  - Implemented – September 2008
  - First MTP – September 2008, with days of implementation

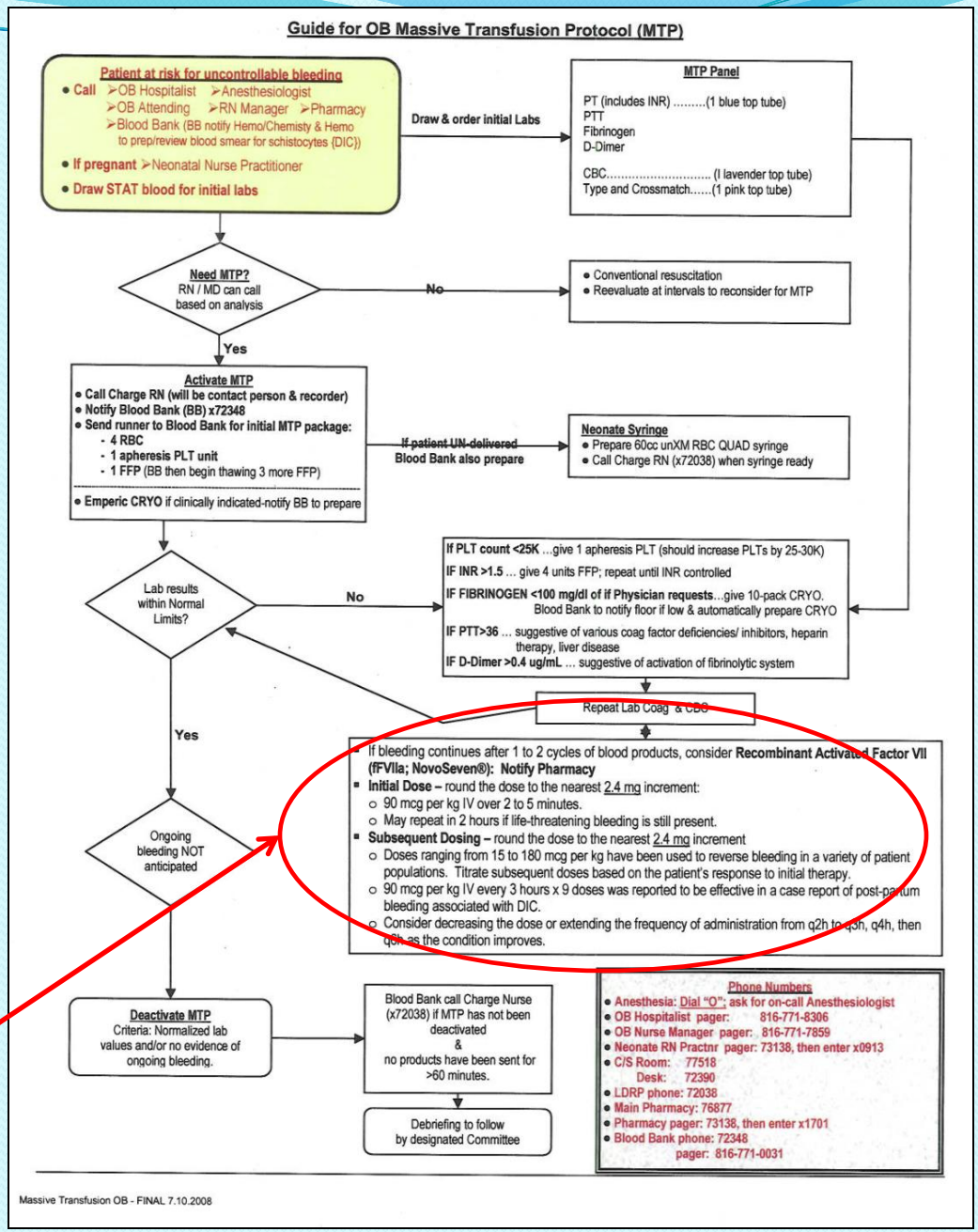
MTP Overview

- Nursing initiates MTP when a patient presents with a massive hemorrhage or is at high risk for such as identified by pre-existing conditions
- The Blood Bank releases a pre-packed set of products to begin immediate transfusion
- STAT labs drawn in cycles
- Anesthesiology and obstetricians guide resuscitation of patient based on clinical symptoms during the dynamic hyperacute phase of the hemorrhage.
- After each MTP, review by Blood Bank Medical Director
- Yearly drills

MTP Flowchart

- What to do
- Who to call
- Phone/pager numbers

Note: Use of rVIIa currently under review



Nursing Action - Patient at risk for uncontrolled bleeding

- Notify Charge Nurse to make calls and be official communicator of event
  - OB hospitalist
  - OB private physician
  - Anesthesiologist
  - Blood Bank
  - Pharmacy
  - Nurse Manager
  - Designate Blood Bank Runner

Nursing Action – If patient is still pregnant

- Call Neonatal Nurse Practitioner
- If hemorrhage occurs and patient not yet delivered, call Blood Bank to prepare neonatal 60cc uncrossmatched O-Neg RBC syringe

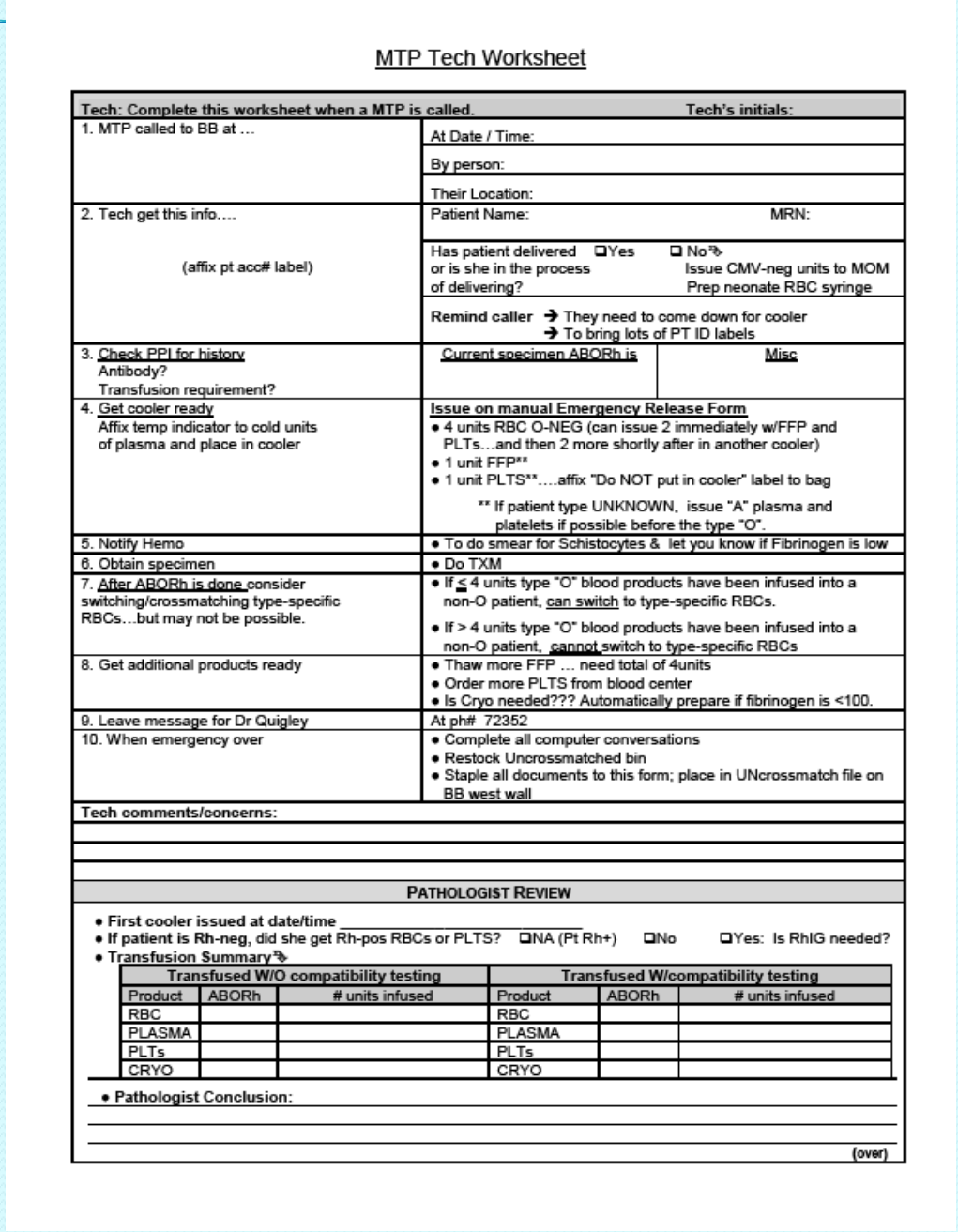
Blood Bank Action – Issue Transfusion Package within ~ 5 minutes

- 4 units O-Neg RBCs unXM'd
- 1 Platelet
- 1 Plasma

MTP Blood Bank Tech Worksheet

- Tech uses to document actions and concerns

- After MTP, given to Blood Bank Medical Director for review



MTP Tech Worksheet

Tech: Complete this worksheet when a MTP is called.	Tech's initials:
1. MTP called to BB at …	At Date / Time: By person: Their Location:
2. Tech get this info…. (affix pt acc# label)	Patient Name: MRN: Has patient delivered ❑Yes ❑ No➔ or is she in the process Issue CMV-neg units to MOM of delivering? Prep neonate RBC syringe **Remind caller** ➔ They need to come down for cooler ➔ To bring lots of PT ID labels
3. Check PPI for history Antibody? Transfusion requirement?	Current specimen ABORh is / Misc
4. Get cooler ready Affix temp indicator to cold units of plasma and place in cooler	**Issue on manual Emergency Release Form** • 4 units RBC O-NEG (can issue 2 immediately w/FFP and PLTs…and then 2 more shortly after in another cooler) • 1 unit FFP** • 1 unit PLTS**….affix "Do NOT put in cooler" label to bag ** If patient type UNKNOWN, issue "A" plasma and platelets if possible before the type "O".
5. Notify Hemo	• To do smear for Schistocytes & let you know if Fibrinogen is low
6. Obtain specimen	• Do TXM
7. After ABORh is done consider switching/crossmatching type-specific RBCs…but may not be possible.	• If ≤ 4 units type "O" blood products have been infused into a non-O patient, can switch to type-specific RBCs. • If > 4 units type "O" blood products have been infused into a non-O patient, cannot switch to type-specific RBCs
8. Get additional products ready	• Thaw more FFP … need total of 4units • Order more PLTS from blood center • Is Cryo needed??? Automatically prepare if fibrinogen is <100.
9. Leave message for Dr Quigley	At ph# 72352
10. When emergency over	• Complete all computer conversations • Restock Uncrossmatched bin • Staple all documents to this form; place in UNcrossmatch file on BB west wall
Tech comments/concerns:	

PATHOLOGIST REVIEW

- **First cooler issued at date/time** _____
- **If patient is Rh-neg,** did she get Rh-pos RBCs or PLTS? ❑NA (Pt Rh+) ❑No ❑Yes: Is RhIG needed?
- **Transfusion Summary➔**

Transfused W/O compatibility testing			Transfused W/compatibility testing		
Product	ABORh	# units infused	Product	ABORh	# units infused
RBC			RBC		
PLASMA			PLASMA		
PLTs			PLTs		
CRYO			CRYO		

- **Pathologist Conclusion:**

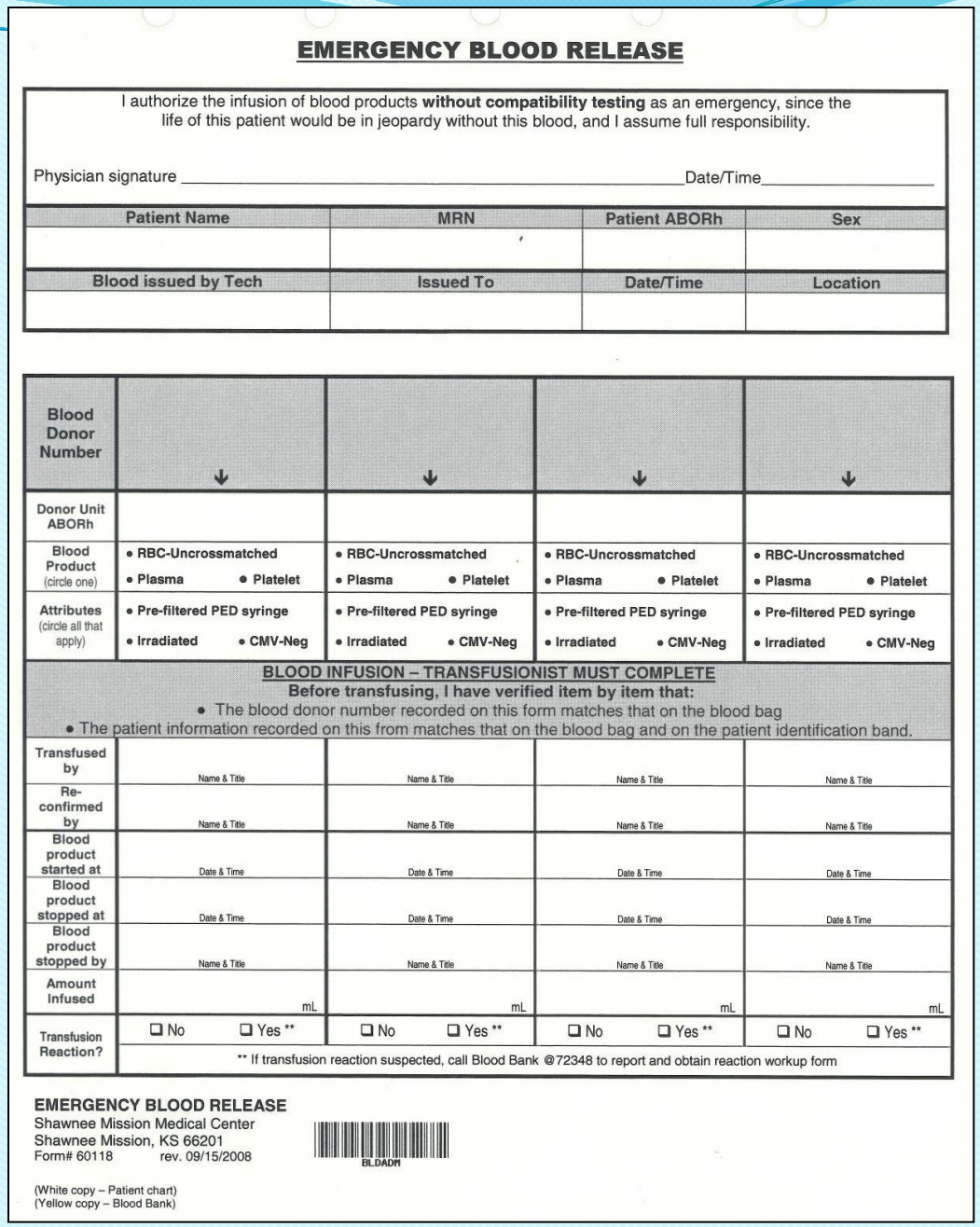
(over)

For Prompt Issue of Blood

- Stock 4 units O-Neg RBCs , thawed plasma and platelets
- Uncrossmatched labels affixed
- Segments already pulled
- Emergency Blood Release form completed as much as possible
- Issue blood products on paper from; bypass computer

Emergency Blood Release Form

- 2-part form
- 4 units blood products per page
- Can be a mix of products
  - RBC
  - Plasma
  - Platelet
  - PED Syringe Pre-filtered
- Attributes listed
  - Irradiated
  - CMV-Neg
- Blood infusion documented on form



EMERGENCY BLOOD RELEASE

I authorize the infusion of blood products **without compatibility testing** as an emergency, since the life of this patient would be in jeopardy without this blood, and I assume full responsibility.

Physician signature _____ Date/Time_____

Patient Name	MRN	Patient ABORh	Sex

Blood issued by Tech	Issued To	Date/Time	Location

Blood Donor Number	↓	↓	↓	↓
Donor Unit ABORh				
Blood Product (circle one)	• RBC-Uncrossmatched • Plasma • Platelet	• RBC-Uncrossmatched • Plasma • Platelet	• RBC-Uncrossmatched • Plasma • Platelet	• RBC-Uncrossmatched • Plasma • Platelet
Attributes (circle all that apply)	• Pre-filtered PED syringe • Irradiated • CMV-Neg	• Pre-filtered PED syringe • Irradiated • CMV-Neg	• Pre-filtered PED syringe • Irradiated • CMV-Neg	• Pre-filtered PED syringe • Irradiated • CMV-Neg

BLOOD INFUSION – TRANSFUSIONIST MUST COMPLETE

Before transfusing, I have verified item by item that:

- The blood donor number recorded on this form matches that on the blood bag
- The patient information recorded on this from matches that on the blood bag and on the patient identification band.

Transfused by	Name & Title	Name & Title	Name & Title	Name & Title
Re-confirmed by	Name & Title	Name & Title	Name & Title	Name & Title
Blood product started at	Date & Time	Date & Time	Date & Time	Date & Time
Blood product stopped at	Date & Time	Date & Time	Date & Time	Date & Time
Blood product stopped by	Name & Title	Name & Title	Name & Title	Name & Title
Amount Infused	mL	mL	mL	mL
Transfusion Reaction?	❑ No ❑ Yes **	❑ No ❑ Yes **	❑ No ❑ Yes **	❑ No ❑ Yes **

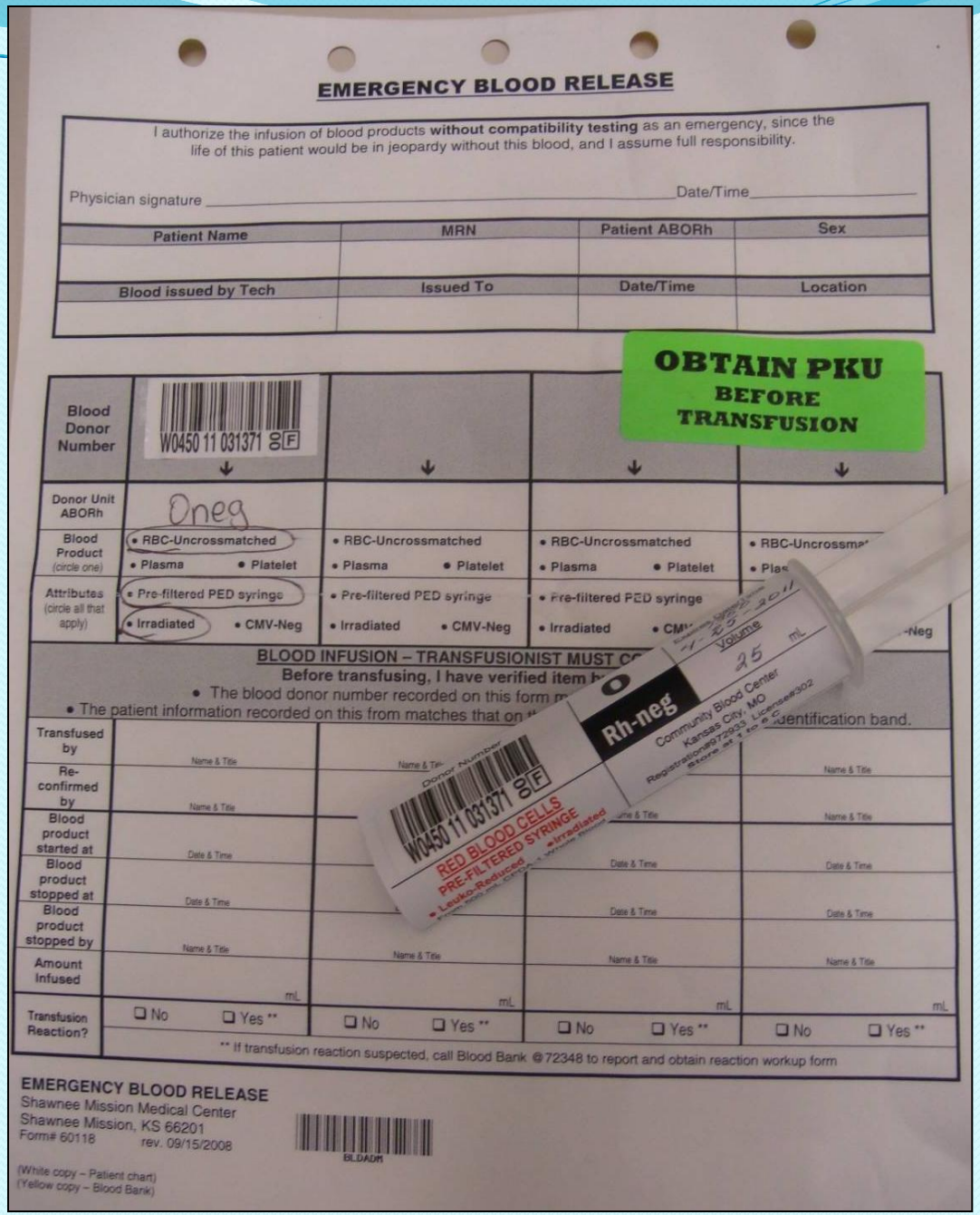
** If transfusion reaction suspected, call Blood Bank @72348 to report and obtain reaction workup form

EMERGENCY BLOOD RELEASE
Shawnee Mission Medical Center
Shawnee Mission, KS 66201
Form# 60118 rev. 09/15/2008

BLDADM

(White copy – Patient chart)
(Yellow copy – Blood Bank)

Emergency Release of PED RBC Syringe



Initial STAT Labs Drawn

- Prothrombin (PT)
- Partial thromoplastin (PTT)
- Fibrinogen
- D-dimer
- CBC & slide review for schistocytes
- Type and crossmatch

Reevaluation of Patient

- Anesthesia continues to draw labs
- Based upon current labs, individual products or repeat of entire MTP package may be ordered
- Consider use of Recombinant Factor VIIa (rVIIa) as a last resort for a massive hemorrhage patient in whom standard medical and surgical measures of stabilization are unsuccessful

Off-label Use of rVIIa Under Review

- Use of rVIIa in PPH is empirical off-label use
- rVIIa designed for use in patients with Hemophilia, especially those who have Factor VIII inhibitors.
- Increased risk of thromboembolism
- Studies continue to evaluate – most recent April 2011 (see references)
- Use as a last resort in PPH: Consider use only after standard surgical and medical intervention has failed to halt life-threatening hemorrhage

Stabilization Phase of MTP

- Lab results within normal limits
- Bleeding controlled
- Charge Nurse calls blood bank to deactivate the MTP
- Blood Bank calls Charge Nurse if no blood products have been ordered for 60 minutes

2008 - 1st MTP Case Study

Occurred a Few Days after MTP Implemented

Lab Values

- PT 16.0
- PTT 53.3
- Fibrinogen level 86mg/dL
- D-dimer >20,000 ng/dL

➢ Lab values indicative of DIC

1st MTP Case Study Outcome

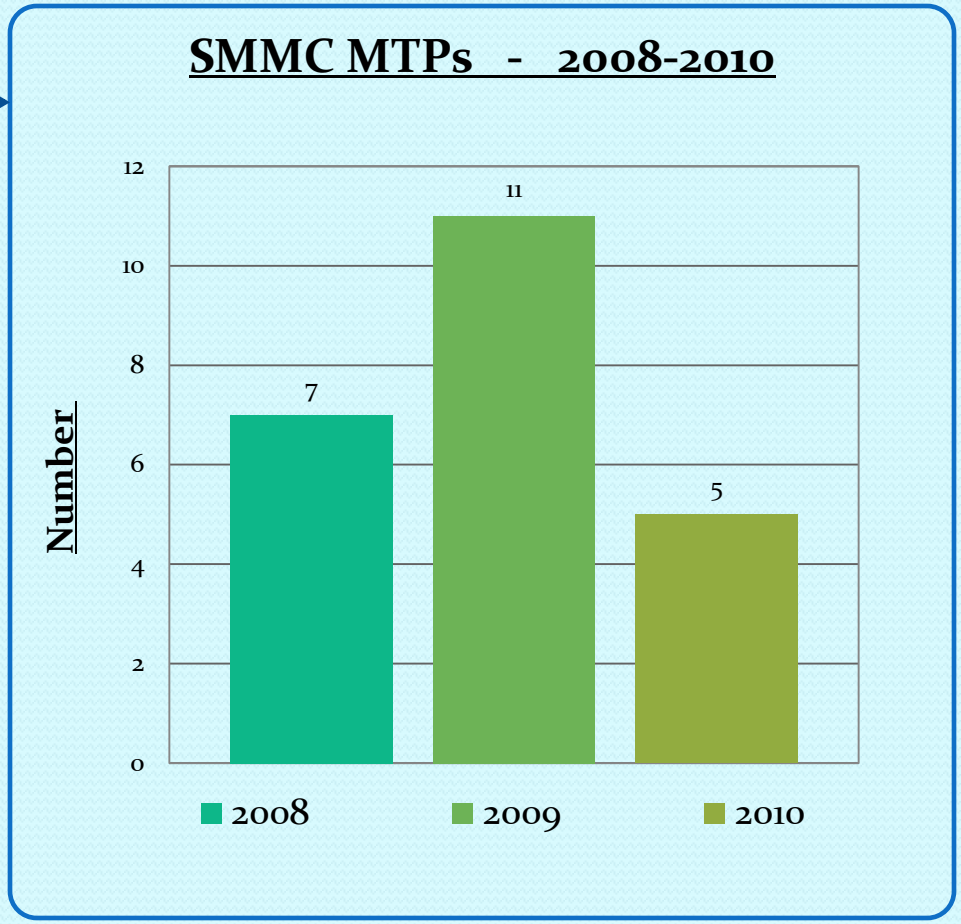
- MTP initiated – no confusion
- First package of blood products issued in ~ 5 minutes
  - 4 units RBCs
  - 1 unit Plasma
  - 1 unit apheresis Platelets
- Emergent hysterectomy performed
- Total transfusion –
  - 16 RBCs
  - 15 FFP/Plasma
  - 10 Cryoprecipitate
  - 5 Apheresis Platelets
- Patient admitted to ICU and discharged 4 days postpartum
- Pathology of uterus demonstrated placenta acreta (placenta attached deep into uterine wall)

SMMC Current Data

Number of MTP s →

SMMC Deliveries

- 2010 = ~ 4,000 deliveries
  (~ 11 per day)
- 2nd highest in Kansas
- 1st in Kansas City area
- Anticipated PPH = 200
- Anticipated MTP = 8



Clinical Assessment and Communication with Blood Bank are key essentials to a successful MTP

References

- Burtelow M, Riley E, Druzin M, Fontaine M, Viele M, LT. How we treat: management of life-threatening primary postpartum hemorrhage with a standardized massive transfusion protocol. Transfusion 2007;47:1564-72.
- Selo-Ojeme DO. Primary postpartum hemorrhage. J Obstetrics Gynecology 2002;22:463-9.
- Yank V, et al. Systematic Review: Benefits and Harms of In-Hospital Use of Recombinant Factor VIIa for Off-Label Indications. Annals of Internal Medicine. April 2011; 154: 529-540.
- Avorn J, Kesselheim A. Editorial: A Hemorrhage of Off-Label Use. Annals of Internal Medicine . April 2011; 154:566-567.