OB Massive Transfusion Protocol

Presented by:

Conna Hiltner, CLS (ASCP), Blood Bank
Shawnee Mission Medical Center
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
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

<table>
<thead>
<tr>
<th>MTP Tech Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tech:</strong> Complete this worksheet when a MTP is called.</td>
</tr>
<tr>
<td>1. MTP called to BB at …</td>
</tr>
<tr>
<td>by person:</td>
</tr>
<tr>
<td>Their Location:</td>
</tr>
</tbody>
</table>

| 2. Tech get this info….          | Patient Name: |
| (affix pt acoc# label)            | MFN: |
| Has patient delivered O/Yes or A/No of delivering? | Issue OMV–neg units to MCM |
| Remind caller ³ They need to come down for cooler |
| ³ To bring lots of PT ID labels |

| 3. Check PPI for history        | Current specimen ABO/Rh is |
| Antibody?                        | Misc |
| Transfusion requirement?        | |

| 4. Get cooler ready             | Issue on manual Emergency Release Form |
| ARx temp indicator to cold units of plasma and place in cooler |
| ³ 4 units RBC O-NEG (can issue 2 immediately w/FFP and PLTs… and then 2 more shortly after in another cooler) |
| ³ 1 unit FFP+                   | |
| ³ 1 unit PLT5***… affix ³ Do NOT put in cooler label to bag |
| ³ If patient type UNKNOWN, issue A plasma and platelets if possible before the type O. |

| 5. Notify Hemo                  | |
| ³ To do smear for Schistocytes & let you know if Fibrinogen is low |

| 6. Obtain specimen              | Do TXM |

| 7. After ABO/Rh is done consider switching/crossmatching type specific RBCs… but may not be possible. |
| ³ If ≤ 4 units type O blood products have been infused into non-O patient, can switch to type specific RBCs. |
| ³ If > 4 units type O blood products have been infused into non-O patient, cannot switch to type specific RBCs |
| ³ More FFP… need total of 4 units |
| ³ Order more PLTs from blood center |
| ³ Is Cryo needed?? Automatically prepare if fibrinogen is <100. |

| 8. Get additional products ready | |

| 9. Leave message for Dr. Quigley | At ph# 72382 |
| 10. When emergency over          | Complete all computer conversations |
|                                  | Return Unmatched bag |
|                                  | Staple all documents to this form; place in Unmatched file on BB west wall |

**Tech comments/concerns:**

**PATHOLOGIST REVIEW**

- First cooler issued at date/time
- If patient is R-h-neg, did she get Rh-pos RBCs or PLTs? [N]A (Fl Rh+) [R]h [N]o [Y]es: Is RhG needed?
- **Transfusion Summary**

<table>
<thead>
<tr>
<th>Transfused W/O compatibility testing</th>
<th>Transfused W/O compatibility testing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td>ABO/Rh</td>
</tr>
<tr>
<td>RBC</td>
<td>RBC</td>
</tr>
<tr>
<td>PLTs</td>
<td>PLTs</td>
</tr>
</tbody>
</table>

| **Pathologist Conclusion: | | |

(Continued)
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

<table>
<thead>
<tr>
<th>Blood Donor Number</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC-Uncrossmatched</td>
<td>Plasma</td>
<td>Platelet</td>
<td></td>
</tr>
<tr>
<td>RBC-Uncrossmatched</td>
<td>Plasma</td>
<td>Platelet</td>
<td></td>
</tr>
<tr>
<td>RBC-Uncrossmatched</td>
<td>Plasma</td>
<td>Platelet</td>
<td></td>
</tr>
<tr>
<td>RBC-Uncrossmatched</td>
<td>Plasma</td>
<td>Platelet</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes** (circle all that apply):
- Pre-filtered PED syringe
- Irradiated
- CMV-Neg

**Blood Infusion – Transfusionist Must Complete**

Before transfusing, I have verified item by item that:
- The patient information recorded on this form matches that on the blood bag and on the patient identification band.

<table>
<thead>
<tr>
<th>Transfused by</th>
<th>Name &amp; Title</th>
<th>Name &amp; Title</th>
<th>Name &amp; Title</th>
<th>Name &amp; Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-confirmed by</td>
<td>Name &amp; Title</td>
<td>Name &amp; Title</td>
<td>Name &amp; Title</td>
<td>Name &amp; Title</td>
</tr>
<tr>
<td>Blood product started at</td>
<td>Date &amp; Time</td>
<td>Date &amp; Time</td>
<td>Date &amp; Time</td>
<td>Date &amp; Time</td>
</tr>
<tr>
<td>Blood product stopped at</td>
<td>Date &amp; Time</td>
<td>Date &amp; Time</td>
<td>Date &amp; Time</td>
<td>Date &amp; Time</td>
</tr>
<tr>
<td>Blood product stopped by</td>
<td>Name &amp; Title</td>
<td>Name &amp; Title</td>
<td>Name &amp; Title</td>
<td>Name &amp; Title</td>
</tr>
<tr>
<td>Amount Infused</td>
<td>mL</td>
<td>mL</td>
<td>mL</td>
<td>mL</td>
</tr>
<tr>
<td>Translation Reaction?</td>
<td>☐ No</td>
<td>☐ Yes</td>
<td>☐ No</td>
<td>☐ Yes</td>
</tr>
</tbody>
</table>

**EMERGENCY BLOOD RELEASE**
Shawnee Mission Medical Center
Shawnee Mission, KS 66201
Form # 00118
rev. 09/15/2008

(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)
Number of MTP's

**SMMC Deliveries**
- 2010 = ~ 4,000 deliveries (~ 11 per day)
- 2\textsuperscript{nd} highest in Kansas
- 1\textsuperscript{st} 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


