

# A Systematic Method for Quality Review of Massive Transfusion Protocol (MTP) Compliance

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## ABSTRACT

In September of 2017 it was brought to the attention of the Trauma Quality Management Committee (TQMC) the noncompliance with 1-1-1 ratios for massive transfusions in trauma patients. The trauma surgeons reported inconsistent ratios received from the blood bank as a contributing factor to the issue. Key players to gather data, implement an action plan and monitor outcomes were identified. The lessons learned in our project are applicable to trauma centers struggling with applying a systematic method to MTP compliance review and can pass on valuable tools and interventions we have found to be successful in improving our trauma center's compliance with the MTP.

## REFERENCES

1. ACS TQIP Guidelines for Massive Transfusion in Trauma.
2. Transfusion. 2017 Aug; 57(8): 1879-1884. doi: 10.1111/trf.14139. Epub 2017 Jun 8.



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## INTRODUCTION

Hemorrhage accounts for the most common cause of trauma related death in the first hour after arrival to a trauma center. Trauma patients who are actively hemorrhaging and/or demonstrate clinical instability commensurate with blood loss of one half their blood volume will be considered candidates for initiation of the Massive Transfusion Protocol (MTP). The development and implementation of Massive Transfusion Protocols (MTPs) contributed to a reduction in mortality and blood product use in trauma centers. Broward Health Medical Center introduced a MTP in 2006 and has continuously evaluated the efficacy of the protocol and monitored patient outcomes. The recent identification of noncompliance with the 1-1-1 ratio of blood products initiated a PI project to improve compliance.

## KEY PLAYERS AND ACTION PLAN

- Trauma Program Administration
  - Trauma Surgeons
  - Blood Bank, Anesthesia
  - Nursing Staff in Trauma, OR, ICU
- Track MTP data concurrently and report to TQMC on a monthly basis. Identify opportunities for improvement, process changes, staff education, etc.
  - Develop a worksheet to track data
  - Work with blood bank for real time information on products dispensed for use in the data collection
  - Assign a trauma registrar champion to assist in collecting the data

Figure 1. MTP Compliance Worksheet

Table 1. First Monthly Data Collection Sheet- Presented to TQMC 11/2017

Massive Transfusion Protocol (MTP) Focused Audit October 2017									
Arrival Date/Time	Patient Initials	ED Disposition	Call placed to BB at initiation/time	MTP order placed correctly in EMR/time	RBC/FFP/PLT(pack) TRANSFUSED*	RBC/FFP/PLT(pack) DISPENSED*	Time MTP Discontinued	Call placed to BB at time of MTP d/c/time	Expired at time of MTP D/C
10/26/17 1142	RG	OR	NO	NO	32/30/8	40/40/8	1745	YES/1745	NO
10/20/17 445	JD	OR	NO	NO	1/1	15/15/3	Not documented	YES/0531	NO
10/21/17 0121	TC	ME	YES/0137	YES/0134	19/15/3	25/25/5	Not documented	YES/0226	YES
10/14/17 0430	PB	OR	NO	NO	25/31/6	40/40/8	Not documented	NO	NO
10/13/17 1832	AR	OR	NO	NO	8/7/2	10/10/2	Not documented	NO	NO
10/8/17 1139	DD	OR	YES/1150	YES/1155	1/1	10/10/2	1158	NO	NO

\*Initial 2 units of emergency release pRBCs provided in ED subtracted from RBC total, if given.  
\*Emergency release pRBCs provided in ED not included in the total number of dispensed products.

Each MTP above was evaluated utilizing the attached work sheet, as quickly as possible following the discontinuation of the MTP. Numbers and information may change as final documentation is scanned into the EMR.

## RESULTS

- 1) The blood bank supervisor reported small size and an insufficient amount of coolers to transport blood was contributing to incomplete sets. **ACTION:** Appropriate coolers purchased and stocked. Blood bank staff advised to send only full sets of 5 PRBC, 5 FFP and a pack of platelets with each MTP round every 20 minutes.
- 2) Inconsistencies in activation and de-activation phone calls to the blood bank and appropriate order selection in EMR. **ACTION:** Education of nursing staff and unit secretaries on the importance of phone calls and order accuracy via counseling, memos, etc.
- 3) Hyperkalemia induced by MTP/possible age of blood products and over resuscitation identified in 2 cases. **ACTION:**
  - Addition of a time out process for anesthesia and trauma surgeon to communicate ongoing resuscitation needs and bleeding control
  - Addition of an I-STAT test after every other set of blood products
  - Addition of a procedure for the blood bank to use new blood first and then gain approval from the trauma surgeon before dispensing blood greater than 20 days old

Table 2. Current Monthly Data Collection Sheet- Presented to TQMC 2/2019

Massive Transfusion Protocol (MTP) Focused Audit December 2018 and January 2019									
Arrival Date/Time	Patient Initials	ED Disposition	MTP order placed correctly in EMR/time	RBC/FFP/PLT(pack) TRANSFUSED*	RBC/FFP/PLT(pack) DISPENSED*	Time MTP Discontinued	Expired at time of MTP D/C	Trauma Surgeon	Anesthesia
12/6/18 1946	GS	OR	YES/1942	5/5/1	5/5/1	Not documented	NO		
12/7/18 2210	JD	OR	YES/2226	30/30/6	36/35/7	0008	YES		
12/8/18 2014	DH	OR	YES/2014	10/7/1	15/15/3	2110	YES		
12/18/18 1849	EM	OR	YES/1858	39/41/8	35/35/7	2245	NO		
12/26/18 2113	BJ	OR	YES/2250	2/1/1	5/5/1	Not documented	NO		
12/28/18 0048	CL	OR	YES/0052	15/15/6	20/20/4	1441	NO		
12/30/18 1843	AS	ME	YES/1846	2/4/1	15/5/1	1900	YES		
1/2/19 1416	FK	OR	YES/517	10/25/16	45/45/9	1920	NO		
1/21/19 2034	SL	OR	YES/2103	5/5/2	15/15/2	2142	NO		
1/26/19 225	DM	ICU	YES/0236	2/2/6	5/5/1	0319	NO		

\*Initial 2 units of emergency release pRBCs provided in ED subtracted from RBC total, if given.  
\* Numbers and information may change as final documentation is scanned into the EMR.

## CONCLUSIONS

- MTP noncompliance is often multifaceted and the involvement of the multidisciplinary stakeholders early on in a PI project is both productive and essential
- The development of a tool to monitor each MTP in real time is helpful. The dynamic tool should evolve with the project
- Concurrent review and mitigation of concerns and a regular forum to present and discuss data trends allows for ongoing interest, accountability and investment in the project
- Opportunities that arise may be unanticipated and not strictly related to ratio compliance or the original issue initiating the PI project