

Massive Transfusion Protocol

Background: Protocolized transfusion has been shown to improve clinical outcomes as well as transfusion efficiency in patients who require massive transfusion (>10 u in 24 hours). This document provides guidelines for utilization of the massive transfusion protocol (MTP) at VUMC.

1. Patient selection

- a. Patients with current, ongoing, or impending massive blood loss should be considered for activation of MTP.
- b. Activation of the massive transfusion protocol should be strongly considered for patients who receive more than two units of blood in the emergency department, or who have an ABC score of 2 or greater.^{1,2}

ABC Score: One point for each of the following

- HR > 120
- SBP < 90
- Penetrating mechanism
- + FAST

2. Activation

- a. MTP may be activated by the attending surgeon, intensivist or designated surrogate. If surrogate activates MTP, attending surgeon of record must be provided to blood bank (BB).
- b. MTP may be activated by trauma/surgical cc faculty, fellows and instructors; anesthesiology faculty; and selected surgical faculty ONLY.
- c. Upon suspicion of MTP activation, type and screen must be sent to BB as soon as possible (preferably within 15 minutes of activation).
- d. To activate MTP, call the BB at 2-2233 and provide the following information
 - i. “This is Dr. ____ activating MTP.....”
 - ii. Patient name
 - iii. Patient MRN. This will be repeated by BB personnel for verification purposes.
 - iv. Patient age
 - v. Patient gender
 - vi. Current location

3. Product breakdown

- a. Each round of MTP provides 6U PRBC, 4U FFP, 1 apheresis unit of platelets
- b. Repeat rounds of MTP contain identical product “doses”
- c. If at point during the MTP there are delays due to thawing of plasma, an incomplete cooler will be offered.

4. Administration

- a. Default is to continue MTP until verbally discontinued by the activating physician or designated surrogate.
- b. MTP boxes are intended to be given in their entirety until completed. If not all products are desired, strong consideration should be given to MTP discontinuation.
- c. When cooler number 5 is delivered, there will be a sticker placed on cooler and the OR circulator will announce that cooler number is in the room.

- d. Surgery and Anesthesia will at this point discuss overall clinical status, salvageability of the patient, need to transition to damage control/temporizing measures or continuing resuscitation.
 - e. If resuscitation is to be continued, anesthesia team will notify blood bank.
5. Endpoints/termination
- a. When appropriate endpoints are reached, the MTP must be discontinued to limit resource utilization. Please call 2-2233 to discontinue MTP.
 - b. Most reliable transfusion endpoint is a collaborative decision based on operative field examination, laboratory results, and clinical parameters. The attending surgeon must be aware of and in agreement with decision to discontinue MTP.
 - c. Premature discontinuation of MTP should be avoided to minimize catch-up reactive transfusions.
 - d. These labs must drawn with discontinuation of the MTP: CBC, PT/PTT, and fibrinogen
6. Pitfalls, common errors
- a. Failure to send type and screen.
 - i. T&S must be sent upon suspicion of MTP requirement.
 - b. Returning platelets on ice/in the cooler.
 - i. Cold temperature destroys platelets. Must be returned separately.
 - c. Failure to identify significant hemorrhage, delayed MTP activation.
 - i. Results in delayed resuscitation. Over-activation is expected.
 - d. Premature termination.
 - i. Consider continuing MTP until patient stabilizes in the ICU.
 - e. Failure to provide entire box/dose.
 - i. If not, all products are required, d/c MTP and transfuse PRN.
 - ii. Collaborate with intensivist/anesthesiologist regarding transfusion plan.
 - f. Reliability on laboratory tests alone for transfusion indication.
 - i. Laboratory tests are unreliable in the hyperacute setting.

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References:

1. Callcut RA, Cotton BA, Muskat P, et al. Defining when to initiate massive transfusion: a validation study of individual massive transfusion triggers in PROMMTT patients. *J Trauma Acute Care Surg.* Jan 2013;74(1):59-65, 67-58; discussion 66-57. (Prospectively validated all ABC predictors except penetrating mechanism)
2. Nunez TC, Voskresensky IV, Dossett LA, Shinall R, Dutton WD, Cotton BA. Early prediction of massive transfusion in trauma: simple as ABC (assessment of blood consumption)? *J Trauma.* Feb 2009;66(2):346-352. (Simple scoring system using non-lab variables. Score of 2 or greater was 75% sensitive and 86% specific for MT)