

Transfusion Protocols Still Open to Debate

BY DAMIAN McNAMARA

Massive transfusion protocols adopted from the military have conferred a significant survival advantage for some civilian trauma patients, but they remain controversial. Not everyone agrees that 10 or more units of packed red blood cells along with fresh frozen plasma and platelets in the first 24 hours for exsanguinating trauma patients should be the standard. The experience of three prominent researchers – Dr. Christopher Dente, Dr. Bryan Cotton, and Dr. Jeffry Kashuk – helps shed some light on developments in this emerging field.

Improved patient management is one advantage of the massive transfusion protocol (MTP), according to Dr. Dente, associate director of trauma at Grady Memorial Hospital in Atlanta. “I didn’t think the effect it would have on how we can manage patients and how we can close their fascias earlier would be as profound as it is. The amount of bowel edema we see is much less as we reduced the amount of crystalloid. The ability to actually finish operations as opposed to doing damage-control laparotomy and leaving packs in – all of these things are more dramatic than I anticipated,” he said.

Empirical vs. tailored therapy, however, is still subject to debate. Currently, most protocols at civilian level I trauma centers dictate administration of a fixed 1:1:1 ratio of packed red blood cells, fresh frozen plasma (FFP), and platelets. This strategy was associated with increased survival at 6, 24, and 30 days and fewer ICU, ventilator, and hospital days, compared with patients who received lower proportions of FFP and platelets in a retrospective study of 466 trauma patients (*Ann. Surg.* 2008;248:447-58).

An empirical protocol increases efficiency, said Dr. Dente, by allowing the surgeon to start the process with a single phone call, after which the blood

bank continues to make products for pick-up every half-hour.

Although survival improves with this empirical approach, there are concerns about “unbridled administration of fresh frozen plasma and platelets with objective evidence of their specific requirement,” Dr. Kashuk and his colleagues wrote in a review article (*Ann. Surg.* 2010;251:604-14).

Instead, Dr. Kashuk is a proponent of thromboelastography (TEG), a rapid, point-of-care test to determine the necessity and optimal ratio of blood products for a particular exsanguinating trauma patient.

The key with the ratio “is really trying to get back to the physiology and looking at function rather than numbers. No two patients are necessarily the same,” he said in an interview. “The difference between ratios can be enormous when approaching massive transfusion numbers. That’s a lot of products being used if not absolutely necessary, especially considering the impact nationally on the blood banks, as well as the untoward effects, such as multiple organ failure.” Dr. Kashuk is a trauma surgeon at Pennsylvania State Milton S. Hershey Medical Center, Hershey.

“Unfortunately, thromboelastography is not readily available,” Dr. Dente said.

“We have seen a significant learning curve for adoption of this technology,” Dr. Kashuk said. Additional expense, time, and quality control to ensure accurate, reproducible results also are required, he added. “We have found, how-



Dr. Christopher Dente supports the use of MTP in his hospital.

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ever, that once the team becomes comfortable with this approach, they begin to realize that old, standard lab values were essentially paramount to functioning in the dark.”

The identification of appropriate candidates for an MTP is another area of controversy. “We know about 25% of the most critically injured patients after trauma come in coagulopathic. Trying to identify these people is really the crux of the problem,” Dr. Dente said.

Several randomized, controlled trials of MTP are in the design phase, according to Dr. Dente. “The next step is to test this [empirical] protocol vs. a protocol that is more directed by point-of-care coagulation studies like thromboelastography,” he said.

Exactly how to identify which patients require an MTP also is unclear. Initiation of most protocols is based primarily on the surgeon’s call, but some early predictive factors have been identified. For example, Dr. Dente and his colleagues demonstrated that gunshot patients were more likely to require an MTP if the bullet trajectory was multicavity or transpelvic or if the patient had significant, initial base deficit (*J. Trauma* 2010;68:298-304).

Scoring systems also can help to quickly identify candidates. For example, the ABC (Assessment of Blood Consumption) system, developed by Dr. Cotton and his colleagues, correctly identified 85% of 596 trauma patients who required a massive transfusion (*J. Trauma* 2009;66:346-52). ABC scoring is based on four factors: emergency department

systolic blood pressure of 90 mm Hg or less; ED heart rate of 120 bpm or greater; a penetrating mechanism of injury; and positive fluid on abdominal ultrasound.

TASH (Trauma-Associated Severe Hemorrhage) is another scoring system (*J. Trauma* 2006;60:1228-36). “At the present time, one of several validated scoring systems – ABC, TASH – will rapidly identify those who require massive transfusion with an over-triage rate [positive predictive value] of about 50% and under-triage rate [negative predictive value] of about 5%,” said Dr. Cotton, who is on the surgery faculty in the division of acute care surgery at the University of Texas at Houston.

Another concern with MTPs is knowing when to call off the protocol. “You have to get a feel for when to stop, because if you forget to call [your blood bank], they are going to continue making products,” Dr. Dente said. “Once you get bleeding control as the operating surgeon, you have to communicate that. If you don’t ... you have the potential to actually waste products or to give products unnecessarily.”

Dr. Dente and his colleagues reviewed their MTP use at Grady Memorial and found a 27% over-triage rate, which meant that the protocol was activated for more than one-quarter of patients who never received a massive transfusion (*J. Trauma* 2010;68:298-304).

Overall resource use does not change significantly, but the timing does. “The goal of an MTP is to change the amount of transfusions on the back end,” Dr. Dente said.

Dr. Dente and Dr. Kashuk said they have no relevant financial disclosures. Dr. Cotton said he recently received a grant from Haemonetics Corp. (makers of a TEG system) for an investigator-initiated, multicenter study evaluating the ability of rapid TEG to describe coagulopathy in severely injured patients. ■

COMMENTARY

Use a Standardized Strategy for Accounts Receivable

Management of accounts receivable is a significant issue in all private offices. In most cases, the patient-owed portion can be kept out of the accounts receivable in the first place.

Collect as much as possible at the time of service, even if you have to offer a discount for immediate payment. When immediate payment is impossible, or you must wait for the insurance explanation of benefits, ask for a credit card number you can keep on file and charge as soon as you know the balance due.

Sending statements should be a last resort, but they should be sent promptly, and no more than three times before you refer the account for collection.

Most difficult or awkward collection problems can be categorized, and you should have a standardized strategy or process for dealing with each one. Those strategies should be assembled as a formal written policy and applied consistently when they arise.

Begin by standardizing as many situations as possible. Make a list of any situations in which you always want the patient balance written off, or always want the balance sent to a collection agency without your direction, or always want to make a case-by-case decision.



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Be specific. What do you want done, for example, when a patient is deceased? Do you want to bill the family or estate, or write off the balance as a bad debt, or some combination of the two? My office has a “sliding scale” based on the size of the balance due, ranging from writing off the smallest balances to deciding the fate of the largest on a case-by-case basis.

What about a patient who claims to have been laid off and does not pay a balance or discontinues payments? Options include referring the account to your collection agency, writing off the balance, or negotiating payment of a reduced balance.

If a patient has no insurance and requests a discount at or before the time of service, you will need to decide if you want to give one, and if so, how much and under which circumstances. My basic no-insurance discount is 40% if payment is made at the time of the visit. Those who can’t pay immediately are offered 25% off if they pay within 30 days of service, 10% if within 60 days.

Delinquent accounts, after collection efforts have been exhausted without success, are usually unsalvageable, although occasionally patients will attempt to negotiate a settlement. I am less generous with discounts under such circumstances, of course, but I usually take 5% off if the balance is paid in full within 10 days, and 10% if paid by credit card immediately.

The main objective is to do everything possible to minimize uncollected accounts by developing a system that works and being disciplined about implementing it. ■

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