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Use of immediate spin phase when crossmatching using PEG-AHG or GEL-AHG techniques

A member writes that at her transfusion service they currently use the **GEL-AHG** technique routinely for **unexpected antibody screening**. They also use a PEG-AHG **tube** method on occasion during critical emergencies when time is a factor. The inquiring member's laboratory does NOT use an immediate spin test as part of their routine antibody screening protocol. However, **for patients who test positive for unexpected red cell antibodies and who need transfusion**, they perform **either** a GEL-AHG crossmatch **OR** a PEG-AHG crossmatch (depending on which method was used for antibody screening), **PLUS** an immediate spin tube test. They include the immediate spin tube test along with the other crossmatch methods because she claims that the package insert for Gamma's PEG-AHG recommends the performance of the immediate spin test **prior to** the addition of PEG in order to detect ABO incompatibility. The inquiring member **would like to know if other members who use a PEG-AHG tube crossmatch or GEL-AHG crossmatch also run an immediate spin tube test when crossmatching patients with unexpected red cell antibodies**. The inquiring member reports that her institutional validation data show that PEG-AHG tube method and GEL technique are equal to the immediate spin test in detecting ABO incompatibility. In two cases the PEG-AHG tube method was superior to immediate spin and GEL technique in detecting ABO incompatibility.

The following replies were submitted in response to the above query

ADDENDA Nov. 17, 2001

1. **A blood bank physician at a San Francisco branch of a major California University system** wrote that at her institution, they use the following algorithm: For **routine** specimens, they perform a type and screen using either the Immucor ABS 2000 or Capture R solid phase methods. For **STAT** specimens, they use Capture R or, more often, PEG-AHG. If the antibody screen is negative, they only do an immediate spin crossmatch to confirm ABO. If the antibody screen is positive, they then do a repeat screen with PEG-AHG to confirm solid phase results, and a subsequent PEG-AHG panel for antibody identification. Any patient with unexpected antibodies who requires blood gets a PEG-AHG crossmatch, usually with units negative for the corresponding antigens. They do not perform an additional immediate spin step. An incompatible crossmatch is further investigated; this often includes confirming the ABO type of the patient and unit. An ABO mistype would give a 3+ to 4+ incompatibility and would not be missed by doing the full crossmatch, so doing an additional immediate spin step would be redundant. Furthermore, a positive result on an immediate spin can be due to other cold-reacting and/or IgM antibodies than ABO, so it can be misleading to do it just for ABO confirmation when the patient has unexpected antibodies.

Editor's NOTE: It is possible for an ABO incompatible donor RBC-recipient pairing to be falsely compatible, even when doing an AHG phase of a major crossmatch. This is especially true when crossmatching A2B donor RBCs against group B recipients. While it may be considered redundant to perform an additional immediate spin step (as suggested by the responding blood banker in this reply) for a patient for whom a PEG-AHG crossmatch is being done, the fact remains that the immediate spin tube test is run because the manufacturer's directions for Gamma's PEG-AHG recommends performance of an immediate spin test prior to the addition of PEG in order to detect ABO incompatibility. **It is prudent to follow the manufacturer's directions when applicable.**

2. **John Judd**, immunohematologist extraordinaire, advises us that "to validate any serological method for its ability to detect ABO errors, one needs to test group B sera with eclectic A2B RBCs; let's say those A2B cells among 12 examples that give the lowest reaction scores with 12 random group B sera. Then one needs to test 50-100 group B sera by the desired method in parallel with the gold standard, a saline immediate-spin crossmatch (IS-XM). We have evaluated IgG gel cards for this purpose and found them to give comparable reactions to IS-XM; haven't looked at PEG. I can't understand why people are concerned about validating gel/PEG for this purpose, when they have not validated prewarmed tests for their ability to detect ABO incompatibility (the very test they are applying prewarming)! Another part of this issue is how to manage samples that are non-reactive in

screening test for unexpected antibodies by gel/PEG, but yield positive IS-XM's. Our approach, prior to implementing the electronic crossmatch was as follows:

- if only a single unit (among several) is incompatible by IS-XM, return that unit to inventory and crossmatch another.
- if some units reactive by IS-XM, others nonreactive, verify patient/donor ABO testing records, then test additional units until sufficient compatible units have been obtained
- if all units reactive by IS-XM, again check records, then crossmatch by screening method for antibody detection (IAT-XM)
- if units incompatible by IAT-XM, perform antibody identification tests One can avoid all these issues by performing an electronic crossmatch.

See references below for additional discussion/data.

- Judd WJ. Are there better ways than the crossmatch to detect ABO incompatibility (editorial)? *Transfusion* 1991;31:192-4.
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- Trudeau LR, Judd WJ, Butch SH, Oberman HA. Is a room temperature crossmatch necessary for the detection of ABO errors? *Transfusion* 1983;23:237-239.
- Judd WJ. Prewarmed tests: con. *Transfusion* 1995;35:271-5.
- Judd WJ, Fullen DR, Steiner EA, Knafel PC, Davenport RD. Revisiting the issue: can the reading for serologic reactivity following 37C incubation be omitted? *Transfusion* 1999;39:295-299.
- Judd WJ. Modern approaches to pretransfusion testing. *Immunohematology* 1999;15:41-52.
- Steiner EA, Judd WJ. Detection of ABO incompatibility in gel. *Transfusion* 1997;37(S):29."

3. **A blood banker in Indiana** wrote that his facility does an immediate spin reading with **PEG-AHG** compatibility testing. They do **not** do an immediate spin reading when they perform **GEL-AHG** compatibility testing.

Please submit comments to the [e-Network Forum](#).

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Posted: November 14, 2001

Addenda: Nov. 17, 2001