

Frequent Fliers in the Reference Laboratory

Robertson Davenport, MD

Associate Professor, University of Michigan Medical School

rddynprt@med.umich.edu

Conflict of Interest: None

Red cell antibody identification is a cornerstone of pretransfusion compatibility testing. Transfusion services commonly perform repeat antibody identification studies on patients who have previously identified antibodies. These patients tend to be multiply transfused and represent a significant fraction of the workload of immunohematology reference laboratories. However, the great majority of these repeated studies do not reveal new clinically significant alloantibodies. Are these repeated studies really necessary?

AABB Standards require that for patients who have been previously transfused or pregnant in the preceding three months a sample shall be obtained within 3 days of transfusion, and that for patients with previously identified clinically significant antibodies, methods of testing shall be those that identify additional clinically significant antibodies.¹ FDA regulations also require that if the patient has been transfused or pregnant in the preceding three months, then pretransfusion testing shall be performed on a sample less than 3 days old, and the procedures used shall demonstrate compatibility between the donor's cell type and the recipient's serum or plasma type.² Does this statement mean that full repeat

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version record](#). Please cite this article as [doi:10.1111/trf.13421](https://doi.org/10.1111/trf.13421).

antibody identification studies must be performed on each new sample? Unfortunately, the literature does not provide much guidance for the reference laboratory director.

In this issue of Transfusion, Goss and colleagues address this problem.³ They examined pretransfusion samples received in a tertiary care medical center over a two year period where there was a history of previous antibodies. They identified samples in which a new clinically significant alloantibody was identified within 14 days of a previous investigation, using typical reference laboratory methods. They excluded previous autoantibodies, passive anti-D, and common “nuisance” non-clinically significant antibodies. Out of 8948 antibody investigations in 2792 patients, they found 33 new antibodies, of which 13 were clinically significant. Five of the new antibodies resulted in no change in the antibody screen reactivity, and one was found using only enhanced methods. Notably, the specificities of these new antibodies were such that they would be expected to cause a positive crossmatch had an antigen positive unit been selected. These results show that while a small number of alloimmunized patients make new clinically significant alloantibodies soon after a previous evaluation, extending the interval of repeat antibody identification studies to 2 weeks could miss some important antibodies and might result in transfusion of incompatible blood.

What then should we do? While pretransfusion testing must be performed on a sample obtained within 3 days of the transfusion, this regulation does not necessarily mean that complete antibody identification studies must always be repeated on each new sample. The requirement to use procedures to identify incompatibility can be satisfied by some combination of the antibody screen, antibody identification panels, and the crossmatch. Transfusion services may consider a policy to not repeat complete studies for some patients. In general, repeat antibody identification should be performed when there is an indication of a potential new problem detected by antibody screen or crossmatch. A patient who has warm or cold autoantibodies or antibodies to high frequency antigens, or for whom

crossmatch compatible red cells cannot be provided, should have a repeat study. Additionally, some patients deserve a second look, such as if a weak reactivity cannot be resolved. The extent of testing and selection of appropriate red cells for testing can be based on the previous results, intended to rule out a new clinically significant alloantibody. It may also be advisable to repeat antibody identification study periodically, even if the screen is unchanged and crossmatches are negative. Each transfusion service should consider their specific patient population, workload and expertise in making such a decision. Finally, we need more studies of this issue to better define the optimal strategy for pretransfusion testing in these patients with typically complex serologic workups. While transfusion safety is a paramount concern, we should not expend unnecessary resources without critical evaluation of our laboratory practices.

References

¹ Levitt, J, ed. Standards for Blood Banks and Transfusion Services. 29th ed. Bethesda, MD: AABB, 2014

² 21CFR606.151

³ Goss C, Scott A, Garbaini J, et al. Can the Interval Between antibody Identifications be Increased for Alloimmunized patients? Transfusion 2016. Vol. 56; ____.