

## Clinical Pathology Selected Abstracts, 1/15

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### **Platelet transfusion: an AABB clinical practice guideline**

Despite long-standing prophylactic use of platelet transfusions, an appropriate transfusion threshold has been a matter of debate. In particular, better data from newly emerging clinical studies has been a focus of this evolving debate. The transfusion trigger for platelets varies widely based on the clinician and his or her area of clinical expertise and institutional affiliation. A new practice guideline on platelet transfusion, commissioned and funded by the AABB (formerly the American Association of Blood Banks), was created to help practitioners determine the appropriateness of various platelet thresholds for specific clinical situations. The guideline is based on a systematic review of literature detailing randomized clinical trials and observational studies that reported clinical outcomes for patients receiving prophylactic or therapeutic platelet transfusions. The outcomes included all-cause mortality, bleeding-related mortality, bleeding, and number of platelet units transfused. Based on the literature review, an expert panel convened by the AABB developed six clinical recommendations using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework. The recommendation with the best quality of evidence was the use of prophylactic platelet transfusions in therapy-induced hypoproliferative, thrombocytopenic adult patients with a platelet count of  $10 \times 10^9$  platelets per liter or less. The AABB noted that provision of a lower platelet dose is just as efficacious as a higher dose. (A platelet dose refers to one apheresis platelet unit or a pool of four to six whole blood-derived platelet concentrates typically containing  $3$  to  $4 \times 10^{11}$  platelets.) However, the group acknowledged that the reduction in prophylactic platelet dose may result in an increased number of transfusions. Other recommendations included prophylactically transfusing patients who have platelet counts below 50,000 per microliter and who are scheduled for a lumbar puncture or major elective nonneuraxial surgery. For placement of central venous catheters, the AABB recommended platelet transfusions for those with a platelet count of less than 20,000 per microliter. The AABB advised against platelet transfusions for patients who have cardiac surgery with cardiopulmonary bypass if their platelet counts and function are within appropriate hematologic parameters. No recommendation was made regarding platelet transfusions for patients receiving antiplatelet therapy for traumatic or spontaneous intracranial hemorrhage. All but the first recommendation are based on low-quality evidence. Despite the weakness of some of the recommendations, this clinical guideline serves as an important decision-making tool for evaluating the platelet transfusion thresholds for various clinical situations. Additional clinical trials with better data are required to refine these guidelines.

Kaufman RM, Djulbegovic B, Gernsheimer T, et al. Platelet transfusion: a clinical practice guideline from the AABB [published online ahead of print November 11, 2014]. *Ann Intern Med*. doi:10.7326/M14-1589.

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### **Value of TEG in determining cause of bleeding associated with cardiopulmonary bypass**

A common complication of cardiac surgery with cardiopulmonary bypass is intraoperative and postoperative bleeding. Therefore, monitoring and identifying the cause of coagulopathy is an essential part of cardiac surgery. The authors conducted a study to compare the bleeding-monitoring method thromboelastography (TEG) with standard coagulation tests, including prothrombin time (PT), partial thromboplastin time (PTT), fibrinogen, and D-dimer, in patients with active bleeding. They performed a retrospective study of patients who underwent cardiac surgery with cardiopulmonary bypass. A second analysis examined if a shortened TEG R time is associated with

thrombosis. The authors compared TEG with standard coagulation tests in 21 bleeding patients. Of those patients, 15 had normal TEG values and three had a shortened R time. However, all patients had abnormal standard coagulation tests. Postoperative bleeding was noted in 18 of 67 patients who underwent surgery with cardiopulmonary bypass. The TEG R time and coagulation index, PT, and PTT collected after cardiopulmonary bypass were associated with postoperative bleeding in univariate analysis. However, only PT was independently associated with postoperative bleeding in multivariate analysis. With regard to thrombotic events, three of 38 patients with a normal TEG and four of 43 patients with a shortened R time had a thrombotic event. The authors concluded that the shortened TEG R time may not represent a hypercoagulable state. Although TEG is often used to predict bleeding associated with cardiac surgery, this study showed that TEG parameters were not independently predictive of postoperative bleeding. The authors noted, however, that a limitation of the study is the retrospective design of the data collection.

Welsh KJ, Padilla A, Dasgupta A, et al. Thromboelastography is a suboptimal test for determination of the underlying cause of bleeding associated with cardiopulmonary bypass and may not predict a hypercoagulable state. *Am J Clin Pathol.* 2014;142:492-497.

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