



e-Network Forum

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Platelet transfusions during cardiothoracic surgery

A transfusion medicine physician in Southern California reports that the cardiothoracic surgeons at her hospital have their own special "indications" for transfusion, including platelet use. For example, patients with **platelet counts over 100,000** (and often >150,000) are routinely transfused with a unit of plateletpheresis towards the end of the surgery. The inquiring physician has probed for more information about the surgical transfusion practice and one of the answers given to her from a pump tech is that most of the patients are on platelet inactivating drugs (usually Plavix) up until the day of surgery. The inquiring physician wants to know if the platelets that are being infused toward the end of surgery are inactivated by the drug. If so she wonders if there is any time lag between stopping the drug and transfusing the platelets that would make the transfusion of platelets towards the end of surgery beneficial to the patient in the peri-operative time frame?

In response to the above question, the following replies were submitted.

1. **The Editor** suggests that e-network colleagues might find the information at the following links to be of interest:
 - [How long should you wait after administering a dose of the platelet inhibitor Plavix \(clopidogrel\) before a patient may be transfused with platelets?](#)
 - [Specific impairment of human platelet P2Y₁\(AC\) ADP receptor-mediated signaling by the antiplatelet drug clopidogrel](#)
 - [Ticlopidine and clopidogrel](#)
 - [Platelet function inhibitors in the Year 2000](#)
 - [Clopidogrel and thrombotic thrombocytopenic purpura](#)
 - [Does platelet transfusion help patients who bleed while on the drug Reopro?](#)
 2. **A transfusion medicine physician from New York** commented that with regard to the **routine** use of platelet transfusion post-cardiac surgery, there is a growing body of data that suggests the best advice is "**DON'T DO IT, EVER.**" In his opinion, platelet transfusion during or after cardiac surgery has been associated with dramatic increases in multi-organ failure and death. He suggests that the cardiac surgeons in question be referred to Figure 3 in the recent NEJM article on **aspirin** and cardiac surgery (NEJM 2002;347 1309-1317). Patients receiving platelet transfusions routinely, because they had been on aspirin, had a mortality rate of about 11-12% post-operatively compared with about 2% in those receiving no platelet transfusions. Aspirin given immediately after surgery (within 48 hours) reduced this effect markedly but not down to the rate seen in patients receiving aspirin but no platelet transfusions, where there was still a two fold difference. There is also similar data in abstract form from trials of **aprotinin** in cardiac surgery. The New York physician adds that while these are not randomized trials, he believes that the size of the effect is so large that it is extremely unlikely to be due to chance or confounding factors.
- ADDENDUM** Nov. 26, 2002
3. **A transfusion medicine physician in Riyadh, Saudi Arabia**, having read the above comments and those in the article referenced (NEJM, Mangano 2002, 3471309-17), comments that the NEJM article deals with the effect of aspirin, but there is no mention of platelet transfusions. He asks if any colleague can provide a reference as to why one should not be transfusing platelets post-op?
 4. **The transfusion medicine physician from New York** (as in #2 above) responds that while it is true the NEJM study is primarily about aspirin and its striking benefits for CABG patients, the NEJM authors note on page 1313 of the article that "The practices of discontinuing aspirin use before surgery and transfusing platelets after reperfusion, as well as the prophylactic use of antifibrinolytic agents to reduce blood loss during the perioperative period, were associated with increased risks of death and ischemic complications. Those risks were substantially reduced, but still considerable, when aspirin was used (Fig. 3)." According to the New Yorker, if one examines figure 3, the death rate with no aspirin but with platelet transfusion was about 12% and with no aspirin and no platelet transfusion about 2% ($p < 0.001$), a six-fold difference. This difference was much less in the group

receiving aspirin but was still problematic, with platelet transfusions carrying a mortality of about 3% versus no platelet transfusions about 0.5% ($p < 0.001$). These results must also be viewed in the light of other preliminary data suggesting increased multi-organ failure and mortality in those given platelet transfusions (Anesthesia Analgesia 90 SCA19, 2002; Anesthesiology 95 A205, 2001; Bone Marrow Transplantation 22999, 1998). Given the lack of any real evidence of clinical efficacy for routine platelet transfusion postoperatively, the New York physician would argue that unless the evidence of clinically significant thrombocytopenia or thrombocytopenia is convincing, **the routine use of platelet transfusions post-operatively is unwise**. Based on his personal experience, the New Yorker suggests that increased bleeding in the post-operative setting in patients without preoperative risks for hemorrhage is infrequently due to platelet dysfunction or thrombocytopenia and almost always due to surgical bleeding. Nonetheless, surgeons understandably prefer administering platelets empirically rather than waiting for the bleeding to slow down or performing surgical re-exploration. He believes that those surgeons may be doing their patients a disservice and providing little or no benefit by this empirical use of platelet transfusions. **He stresses that we should all remember that one of the most common complications after most types of surgery is not bleeding or infection, but deep vein thrombosis, often clinically asymptomatic**. Contrary to what most of us were taught, the really big risks to patients post-operatively are almost certainly not hemorrhage due to decreased hemostatic function, but in fact excessive activation of platelets and the clotting cascade leading to thrombosis and multi-organ failure syndromes. The liberal and unproven use of platelet transfusion in this setting probably greatly exacerbates the risks of the pro-coagulant, pro-inflammatory state seen post-operatively and contributes to multi-organ failure syndromes. The authors of the NEJM article (347 1309, 2002) make precisely these points about routine use of FFP and platelets in cardiac surgery in the discussion of their manuscript.

ADDENDUM Dec. 6, 2002

5. **Editor's Note:** In response to the discussion about platelet transfusions, the international organization Network for Advancement of Transfusion Alternatives (NATA) has created a link on NataOnline to this e-network issue. Furthermore, NATA has provided a link to a 20-minute A-V Powerpoint presentation given by David Royston during the NATA 3rd Annual Symposium in Rome, Italy. The title of the talk was *Allogeneic platelet transfusion: risks and alternatives (registration free)*.

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

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