Case Study: Intracranial hemorrhage (ICH)

Created by: Jeannie Callum, MD, FRCPC
On behalf of the **International Collaboration for Transfusion Medicine Guidelines (ICTMG)**, in partnership with Canadian Blood Services, to support the "Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines".

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Disclaimer: This case study is intended for educational purposes only. The scenario presented in this case study is entirely fictional and does not describe a real patient or actual clinical event.

Guideline reference: Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025;334(7):606–617. doi:10.1001/jama.2025.7529.

Background

Intracranial hemorrhage (ICH) in patients on antiplatelet agents and/or with thrombocytopenia is an uncommon clinical scenario, with researchers suggesting the rarity of this scenario would necessitate multicentre trials to improve the evidence base.[1] For patients on antiplatelet agents without thrombocytopenia with ICH not requiring immediate surgical intervention, platelet transfusion was found to be inferior to no treatment in the PATCH randomized, controlled trial.[2] There are no other randomized, controlled trials in this patient population. The 2025 AABB-ICTMG, the 2025 European Stroke, and the 2022 US Stroke Guidelines all recommend against platelet transfusion in this clinical scenario.[3-5]

Intracranial hemorrhages in patients with thrombocytopenia occur most commonly in patients with hematological malignancies (most commonly acute myeloid leukemia) and patients with cirrhosis. There are only observational studies in patients with ICH and thrombocytopenia, limiting the evidence to guide clinical practice. In patients with hematological malignancies, the degree of thrombocytopenia and response to platelet transfusions does not appear to impact patient outcomes.[6-8] Only one-third of patients with ICH and thrombocytopenia achieve a platelet count >50x10^9/L after platelet transfusion, hence guidelines recommending targets of >100x10^9/L are unlikely to be clinically realistic.[7,8]

The AABB-ICTMG guideline makes no specific recommendation for patients with ICH and thrombocytopenia.[5] Two guidelines recommended maintaining >50x10^9/L and >100x10^9/L, respectively.[9,10] These recommendations are clearly difficult for clinicians to adhere to when only one-third of patients can achieve a count >50x10^9/L after platelet transfusion.

Population	Recommendation & guidance	Certainty of the evidence*	Summary justification
Adult patients with spontaneous or traumatic, nonoperative intracranial hemorrhage with platelet counts >100 × 10^3/μL, including those receiving antiplatelet agents	No platelet transfusion	Low to very low	The limited data available support no benefit with use of platelets and the possibility of harm

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*The certainty of evidence was determined using GRADE methodology and synthesizing effect estimates across multiple studies, when applicable. GRADE considers imprecision, inconsistency, indirectness, and risk of bias. Imprecision depended on predefined minimal important differences (MIDs). The MIDs chosen by the panel were 2% for mortality, 5%for grade 3-4 bleeding or equivalent, and 20%for grade 2-4 bleeding or equivalent.

Adapted from Table 3. Recommendations for Platelet Transfusion (*Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025;334(7):606–617. doi:10.1001/jama.2025.7529*).

Special considerations

Given the combination of lack of benefit in patients on antiplatelets (and concerningly worse functional outcomes with platelet transfusions in the PATCH trial), lack of correlation of bleeding volumes or re-bleeding with platelet counts and/or response to platelet transfusions, and inability to achieve a platelet count of >50x10^9/L in most patients, platelet transfusion likely play a minimal role in the management of these patients and likely do not improve patient important outcomes. Hence, a restrictive and thoughtful approach is warranted when considering a platelet transfusion in these rare clinical scenarios.

Alternatives

DDAVP (desmopressin) has been evaluated in two recent systematic reviews; there was no clear benefit and a potential concern for thrombosis was observed.[11,12] The only other considerations are ensuring any other coagulation deficits are treated and managed (e.g., fibrinogen or clotting factor deficits).

Scenario

A 74-year-old retired electrician with a history of coronary artery disease (prior drug-eluting stent placed 13 months ago), type 2 diabetes mellitus, hypertension, and hyperlipidemia presents to the emergency department after a fall at home. He had been standing on a step stool attempting to retrieve a casserole dish from the top shelf of the cupboard, lost his balance, and struck the right side of his head against the countertop on the way down before landing on the tile floor. He did not lose consciousness as per his wife, though he was dazed and confused immediately afterward. He takes aspirin 81 mg daily and clopidogrel 75 mg daily (dual antiplatelet therapy following his coronary stent) as well as metformin, lisinopril, atorvastatin, and amlodipine. CT Head shows right frontoparietal intracerebral hemorrhage measuring 2.8 × 2.1 cm (volume approximately 6 mL). No midline shift. No herniation. Appearance consistent with acute hemorrhage. Hemoglobin is 131 g/L, platelet count 198 x 10^9/L, and creatinine 114 umol/L. Neurosurgery has assessed the patient and there is no immediate need for neurosurgical evacuation.

Is platelet transfusion currently indicated for this patient?

- Yes
- No

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Decision

No, platelet transfusion is not currently indicated for this patient.

This patient is the exact type of patient who was enrolled in the PATCH RCT where there were no apparent hemostatic benefits (bleeding outcomes) and functional neurologic outcomes were worse in the patients randomized to the platelet transfusion arm. Hence, no platelet transfusion is indicated currently. If the patient later requires surgical intervention for hematoma expansion, the evidence base is completely absent. Consideration for platelet transfusion can be considered intraoperatively if bleeding at the time of evacuation is greater than expected after careful consideration of the potential harms for worsening patient functional neurological recovery. The least number of platelet doses should be administered, titrated to the rate of bleeding, due to the concerns for worsening patient neurological outcomes.

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