

Case Study: Intracranial hemorrhage (ICH)

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On behalf of the **International Collaboration for Transfusion Medicine Guidelines (ICTMG)** to support the "Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines".

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Case study suggested citation: Callum, J. (2026). Intracranial hemorrhage (ICH). [Case study]. International Collaboration for Transfusion Medicine Guidelines (ICTMG). <https://www.ictmg.org/platelets-2025>

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 $>50 \times 10^9/L$ after platelet transfusion, hence guidelines recommending targets of $>100 \times 10^9/L$ 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 $>50 \times 10^9/L$ and $>100 \times 10^9/L$, respectively.^{9,10} These recommendations are clearly difficult for clinicians to adhere to when only one-third of patients can achieve a count $>50 \times 10^9/L$ after platelet transfusion.

Population	Recommendation & guidance	Certainty of the evidence*	Summary justification
Adult patients with spontaneous or traumatic, nonoperative intracranial hemorrhage with platelet counts $>100 \times 10^3/\mu L$, 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

*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.

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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 concerning 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 $>50 \times 10^9/L$ 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 $198 \times 10^9/L$, and creatinine 114 $\mu\text{mol/L}$. Neurosurgery has assessed the patient and there is no immediate need for neurosurgical evacuation.

Is platelet transfusion currently indicated for this patient?

- Yes
- No

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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References

1. Wilson M, Incontri D, Vu S, et al. Thrombocytopenia as a predictor of hematoma expansion and mortality in intracerebral hemorrhage. *Int J Stroke*. Jun 2026;21(5):718-728. doi:10.1177/17474930251392707
2. Baharoglu MI, Cordonnier C, Al-Shahi Salman R, et al. Platelet transfusion versus standard care after acute stroke due to spontaneous cerebral haemorrhage associated with antiplatelet therapy (PATCH): a randomised, open-label, phase 3 trial. *Lancet*. Jun 25 2016;387(10038):2605-2613. doi:10.1016/S0140-6736(16)30392-0
3. Steiner T, Purrucker JC, Aguiar de Sousa D, et al. European Stroke Organisation (ESO) and European Association of Neurosurgical Societies (EANS) guideline on stroke due to spontaneous intracerebral haemorrhage. *Eur Stroke J*. Dec 2025;10(4):1007-1086. doi:10.1177/23969873251340815
4. Greenberg SM, Ziai WC, Cordonnier C, et al. 2022 Guideline for the Management of Patients With Spontaneous Intracerebral Hemorrhage: A Guideline From the American Heart Association/American Stroke Association. *Stroke*. Jul 2022;53(7):e282-e361. doi:10.1161/STR.0000000000000407
5. Metcalf RA, Nahiriak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. *JAMA*. Aug 19 2025;334(7):606-617. doi:10.1001/jama.2025.7529
6. Maze D, Al-Abri M, Farooq K, Atenafu EG, Nixon S, Lieberman L. Risk factors for intracranial hemorrhage in adults with acute leukemia. *Transfusion*. Dec 2021;61(12):3303-3308. doi:10.1111/trf.16703
7. Chern JJ, Tsung AJ, Humphries W, Sawaya R, Lang FF. Clinical outcome of leukemia patients with intracranial hemorrhage. Clinical article. *J Neurosurg*. Aug 2011;115(2):268-72. doi:10.3171/2011.4.JNS101784
8. Nixon S, Lieberman L, Atenafu EG, et al. Clinical outcomes and transfusion management following intracranial hemorrhage in patients with acute leukemia. *Transfusion*. Feb 2020;60(2):269-274. doi:10.1111/trf.15621
9. Estcourt LJ, Birchall J, Allard S, et al. Guidelines for the use of platelet transfusions. *Br J Haematol*. Feb 2017;176(3):365-394. doi:10.1111/bjh.14423
10. Picetti E, Rossi S, Abu-Zidan FM, et al. WSES consensus conference guidelines: monitoring and management of severe adult traumatic brain injury patients with polytrauma in the first 24 hours. *World J Emerg Surg*. 2019;14:53. doi:10.1186/s13017-019-0270-1
11. Loggini A, El Ammar F, Darzi AJ, et al. Effect of desmopressin on hematoma expansion in antiplatelet-associated intracerebral hemorrhage: A systematic review and meta-analysis. *J Clin Neurosci*. Apr 2021;86:116-121. doi:10.1016/j.jocn.2021.01.017
12. Shahzad F, Ahmed U, Muhammad A, et al. Safety and efficacy of desmopressin (DDAVP) in preventing hematoma expansion in intracranial hemorrhage associated with antiplatelet drugs use: A systematic review and metaanalysis. *Brain Behav*. May 2024;14(5):e3540. doi:10.1002/brb3.3540