Platelet Function Testing-Guided Antiplatelet Dosing for Elective Flow Diversion of Internal Carotid Artery Aneurysms

Summary of a Full-Length Article | J NeuroIntervent Surg 2026;0:1–5 | Diprose WK, Ottavi T, Zinn R, et al.

Why this paper matters to Haemoview

This retrospective, single-center study from a tertiary neurointervention service in New South Wales, Australia describes an institutional practice of adjusting antiplatelet doses — aspirin, prasugrel, clopidogrel, or ticagrelor — based on periprocedural **Multiplate Analyzer** platelet function testing (PFT), with the goal of avoiding both under- and over-inhibition of platelet aggregation. In 109 consecutive patients with internal carotid artery (ICA) aneurysms treated electively with flow diversion, targeting ADP 10–35 U and ASPI 5–20 U led neurointerventionalists to prescribe **low-dose antiplatelets in over half of patients (57, 52.3%)**, while the rate of major ipsilateral stroke or neurological death was **1.8%** and any symptomatic neurological complication occurred in **5.5%** of patients within 6 months.

Study at a glance

Item	Detail
Article type	Retrospective, single-center cohort study of platelet function testing (PFT)-guided antiplatelet dosing for elective ICA aneurysm flow diversion
Authors	Diprose WK, Ottavi T, Zinn R, Wang MTM, Garcia-Bermejo P, Miteff F – Hunter New England Local Health District, New South Wales, Australia, and University of Auckland, New Zealand
Journal	Journal of NeuroInterventional Surgery 2026;0:1–5; DOI: 10.1136/jnis-2026-025747
Clinical scope	109 patients (mean age 57.4±12.9 years, 86.2% female) with unruptured ICA aneurysms treated electively with flow diversion between 1 July 2015 and 30 June 2025
Core finding	Multiplate-guided dose titration (target ADP 10–35 U, ASPI 5–20 U) resulted in low-dose antiplatelets in 52.3% of patients and a low complication rate: 1.8% major ipsilateral stroke/neurological death and 5.5% any symptomatic neurological complication within 6 months
Multiplate link	Preprocedural Multiplate Analyzer impedance aggregometry (ADP, ASPI, and TRAP tests), repeated <24 hours prior to the procedure, guided dose adjustments or agent changes at the treating neurointerventionalist's discretion

The clinical gap this paper closes

Dual antiplatelet therapy is the current standard of care for flow diversion, but responses to aspirin, clopidogrel, prasugrel, and ticagrelor are highly variable between patients. Historically, PFT use in neurointervention has focused on identifying clopidogrel hyporesponders to mitigate thromboembolic risk, but there is increasing evidence that platelet over-inhibition from any antiplatelet drug may increase hemorrhagic complications. This study describes a real-world institutional practice of adjusting all four antiplatelet agents based on periprocedural Multiplate testing to mitigate both thromboembolic and hemorrhagic risks, and reports outcomes in a consecutive elective ICA aneurysm cohort.

Key message: Multiplate-guided antiplatelet titration – adjusting aspirin, prasugrel, clopidogrel, or ticagrelor doses to hit ADP 10–35 U and ASPI 5–20 U targets – led to low-dose regimens in over half of patients and was associated with a low rate of major stroke, neurological death, and symptomatic complications following elective flow diversion for ICA aneurysms.

Key findings in detail

1 | Low-dose antiplatelets were common under Multiplate-guided titration

Aspirin (25–100 mg/day) was used in all 109 patients, prasugrel (1.25–15 mg/day) in 74 (67.9%), clopidogrel (37.5–75 mg/day) in 33 (30.3%), and ticagrelor (90–180 mg/day) in 2 (1.8%). Based on discharge doses, 57 patients (52.3%) were classified as low-dose, 50 (45.9%) standard-dose, and 2 (1.8%) high-dose. The lowest daily doses used – aspirin 25 mg, prasugrel 1.25 mg, clopidogrel 37.5 mg, and ticagrelor 90 mg – were below manufacturer-recommended levels.

Platelet function parameter	Mean±SD	Target range used
ADP (U) – P2Y12 inhibition	22.5±7.6 U	10–35 U
ASPI (U) – aspirin/COX-1 inhibition	12.8±7.8 U	5–20 U
TRAP (U)	104.1±26.0 U	Not specified

2 | Platelet inhibition was comparable between low- and standard-dose groups

Mean ADP was 22.5 U in the low-dose group versus 22.7 U in the standard-dose group; mean ASPI was 12.1 U versus 13.3 U (no statistically significant difference, $p>0.05$). There was no association between age, sex, or body weight and the likelihood of receiving low-dose antiplatelets on univariate logistic regression – individual platelet response could not be predicted from these baseline characteristics.

3 | Complication rates were low overall

Two patients (1.8%) met the primary outcome (major ipsilateral stroke or neurological death within 6 months) – one each in the standard- and low-dose groups, both attributed to confirmed or presumed intracranial hemorrhage; no patient had a major ipsilateral ischemic stroke. Six patients (5.5%) had any symptomatic neurological complication within 6 months, comprising 3 (2.8%) ischemic and 3 (2.8%) hemorrhagic events (including the two neurological deaths).

4 | Current or ex-smoking was the only factor associated with complications

All 6 patients with symptomatic neurological complications were current or ex-smokers, a statistically significant association (Fisher's exact test, $p=0.04$). Multiple stent insertion was associated with complications on univariate analysis (OR 6.86, 95% CI 1.07–44.17, $p=0.04$), but this association was no longer significant after a sensitivity analysis excluding one case of reverse causality (a carotid cavernous fistula requiring multiple stents) (OR 3.43, 95% CI 0.34–34.95, $p=0.30$). Age, sex, weight, symptomatic presentation, aneurysm size, and hypertension were not associated with complications.

5 | Aneurysm occlusion improved over time and was numerically higher with low-dose antiplatelets

Complete aneurysm occlusion (Raymond–Roy classification) was demonstrated in 76/105 (72.4%) patients at 6 months, 68/82 (82.9%) at 18 months, and 53/57 (93.0%) at 3 years or beyond. At 6 months, complete occlusion was nominally higher in the low-dose antiplatelet group (43/56, 76.8%) than the standard-dose group (31/47, 66.0%), though the difference was not statistically significant ($p=0.27$).

Outcome	Result
Major ipsilateral stroke or neurological death <6 months	2/109 (1.8%)
Any symptomatic neurological complication <6 months	6/109 (5.5%)
Complete aneurysm occlusion at 6 months	76/105 (72.4%)
Complete aneurysm occlusion at 18 months	68/82 (82.9%)
Complete aneurysm occlusion ≥3 years	53/57 (93.0%)

6 | Important limitations for clinical interpretation

- Single-center, retrospective design with potential selection bias; no non-PFT-guided comparison group was available.
- Data on the proportion of patients who had antiplatelet doses changed before and after their procedure were not available.
- Prasugrel was the most commonly prescribed low-dose antiplatelet, so further studies are needed to validate low-dose aspirin, clopidogrel, and ticagrelor.
- Most patients received Pipeline Flex with Shield Technology (89.0%); findings may not generalize to stent constructs without antithrombotic coatings, more than 48 braids/wires, or posterior circulation flow diversion.

Relevance to Multiplate users

This paper supports a practical clinical narrative for Multiplate users: periprocedural platelet function testing can guide individualized dosing of aspirin, prasugrel, clopidogrel, or ticagrelor to avoid both under- and over-inhibition, rather than relying on fixed dosing of a single agent.

Paper finding	Relevance to users
Multiplate ADP/ASPI testing guided real-time dose titration	A direct Multiplate link: ADP and ASPI results (targets 10–35 U and 5–20 U) were used to escalate, de-escalate, or switch antiplatelet agents before and again <24 hours prior to the procedure.
Low-dose regimens were common and effective	Over half of patients (52.3%) safely received antiplatelet doses below manufacturer-recommended levels once Multiplate testing confirmed adequate platelet inhibition.
Platelet response could not be predicted from patient characteristics	Age, sex, and body weight were not associated with the need for low-dose antiplatelets, reinforcing the value of individualized testing over fixed, characteristic-based dosing.
Smoking was linked to complications	All symptomatic neurological complications occurred in current or ex-smokers – a useful discussion point for periprocedural risk stratification.
Complication rates compared favorably with published benchmarks	The 1.8% major stroke/neurological death rate and 5.5% any-symptomatic-complication rate were lower than rates reported in the Pipeline for Uncoilable or Failed Aneurysms trial (5.6% and 16.8%) and a contemporary 41-study meta-analysis (7.8% composite outcome), both cited in the article.

Suggested conversation points

- In this cohort, tailoring antiplatelet doses to Multiplate ADP/ASPI targets meant over half of patients safely received low-dose regimens.
- Platelet inhibition was statistically comparable between low- and standard-dose groups, showing that dose alone does not predict platelet response.
- Complication rates (1.8% major stroke/neurological death; 5.5% any symptomatic complication) were low relative to historical flow-diversion benchmarks cited in the paper.
- This is a single-center, retrospective series without a non-PFT-guided comparison group; the authors call for prospective evaluation of PFT-guided dosing.

Sources

Diprose WK, Ottavi T, Zinn R, Wang MTM, Garcia-Bermejo P, Miteff F. Platelet function testing-guided antiplatelet dosing for elective flow diversion of internal carotid artery aneurysms. *Journal of NeuroInterventional Surgery* 2026;0:1–5. DOI: 10.1136/jnis-2026-025747

Disclaimer

This brief is educational information only, prepared for healthcare professionals in Australia. It summarises an external peer-reviewed publication and is not a product claim, instruction for use, dosing recommendation, or substitute for clinical judgement. Clinical decisions must be made according to local protocols, institutional governance, the full clinical context of the individual patient, local product availability, and the official instructions for use of the relevant device, assay, and antiplatelet therapy. Multiplate is a registered trademark of Roche Diagnostics.

MULTIPLATE TESTING:

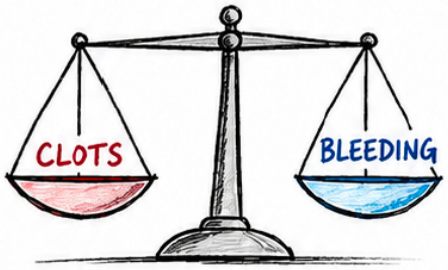
THE RIGHT DOSE IS THE ONE THAT'S RIGHT FOR YOUR PATIENT

Diprose WK et al. J NeuroIntervent Surg 2026 (Epub ahead of print)

THE PROBLEM

Too little platelet inhibition → thromboembolic risk

Too much → bleeding risk



THE APPROACH

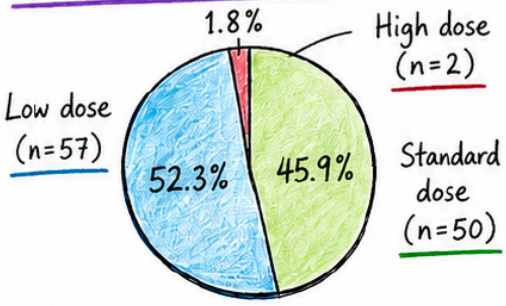
109 patients with ICA aneurysms undergoing elective flow diversion had antiplatelet therapy tailored using Multiplate platelet function testing (PFT).

PFT helps find the sweet spot for each individual.

WHAT THEY FOUND

- More than half of patients (52.3%) were discharged on **LOW-DOSE** antiplatelets.
- Platelet inhibition was comparable between low- and standard-dose groups.

DISCHARGE DOSE GROUPS



6-MONTH OUTCOMES

1.8%	major ipsilateral stroke or neurological death (2 patients)
5.5%	any symptomatic neurological complication (6 patients)
0%	major ipsilateral ischemic strokes

ANTIPLATELETS USED

Aspirin (25-100 mg/day)	100%
Prasugrel (1.25-15 mg/day)	67.9%
Clopidogrel (37.5-75 mg/day)	30.3%
Ticagrelor (90-180 mg/day)	1.8%

WHY THIS MATTERS

PFT isn't just about finding who needs **MORE** treatment. It can also help identify who needs **LESS**.

Precision medicine isn't always a new drug or device. Sometimes it's measuring the response in front of us – and being willing to adjust.

IMPORTANT CAVEAT

Retrospective, single-centre study without a non-testing comparison group. Promising – but prospective validation is still needed.