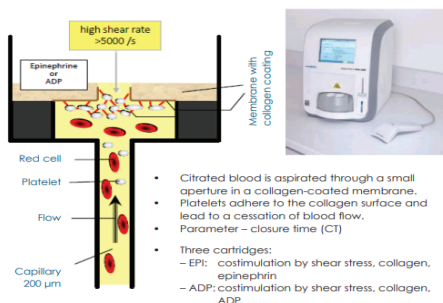


The PFA 100/200 Platelet Function Analyzer

PFA - 100/200
Principle



The PFA-100/200 is a near-patient platelet (PLT) function analyzer that can provide a preliminary diagnosis of von Willebrand disease (VWD) or a platelet function disorder for patients or first-degree relatives of patients with systemic bleeding. The device uses whole blood collected within the previous 4 hours in 3.2% sodium citrate anticoagulant (blue-closure) tubes and maintained at 15–25°C. The operator mixes the specimen by gentle inversion and transfers 800 µL to a cartridge receptacle and places the cartridge in the instrument port.

Upon initiation, the instrument streams a column of whole blood vertically through an aperture infused with collagen and epinephrine in a Collagen-Epi (CEPI) cartridge or a collagen-ADP (CADP) infused cartridge. As the blood passes the aperture the impregnated reagent activates PLTs, the PLTs adhere to the surface and obstruct or “close” the aperture in an interval called the Closure Time (CT). The manufacturer’s CT reference intervals (Ris) for the CEPI and CADP cartridges are 72–191 seconds and 58–123 CT seconds, respectively. Many laboratory scientists first deploy the sensitive CEPI cartridge and follow up with the selective CADP cartridge when the CEPI CT is prolonged.

Results and Clinical Significance

1. CEPI & CADP (if tested) CT within RI: excludes VWD and PLT dysfunction.
2. CEPI CT prolonged, CADP within RI: mild VWD or mild platelet dysfunction.
3. CEPI and CADP CTs prolonged: VWD with 85–90% clinical sensitivity when von Willebrand factor (VWF) is <25 IU/dL or PLT dysfunction with varying clinical sensitivity.
4. CEPI within RI, CADP prolonged: rare, may signal inappropriate RI upper limit or artifact.
5. CEPI and/or CADP short: no proven clinical significance, may signal elevated VWF that associates with elevated thrombotic risk.

Discussion

- The PFA-100/200 measures both PLT aggregation and adhesion.
- The operator reports the numerical CTs with the RI and/or verbally as prolonged, normal, or short.
- Results 2 or 3: F/U with CBC including PLT count, VWD diagnostic profile, and PLT aggregometry.
- CTs are unreliable if prolonged by anemia, thrombocytopenia, anti-PLT drugs aspirin or clopidogrel.
- CTs may be used to track aspirin therapy but are not cleared to diagnose low aspirin response.
- CTs are not cleared to monitor clopidogrel therapy nor diagnose low clopidogrel response.

Recommended

- Favaloro EJ. Clinical utility of closure times using the platelet function analyzer-100/200. *Am J Hematol.* 2017;92:398-404. doi: 10.1002/ajh.24620.
- Vázquez-Santiago M, Vilalta N, Cuevas B, et al. Short closure time values in PFA-100 are related to venous thrombotic risk. Results from the RETROVE Study. *Thromb Res.* 2018;169:57–63. doi:10.1016/j.thromres.2018.07.012.
- Favaloro EJ, Mohammed S, Vong R, et al. Harmonizing platelet function analyzer testing and reporting in a large laboratory network. *Int J Lab Hematol.* 2022;44:934–44. doi: 10.1111/ijlh.13907. PMID: 35754202; PMCID: PMC9545980. (Open Access)