Table 1. Antiplatelet drugs, mechanism of action, and pharmacokinetics (Makris*, et al* 2013, Oprea and Popescu 2013b)

Drug	Mechanism of action	Route of administration	Reversible or irreversible inhibition	Half-life	Time to recover platelet function
Aspirin	COX-1 inhibitor	Oral	Irreversible	15-20 mins	5-7 days
Clopidogrel	P2Y12 inhibitor	Oral	Irreversible	6-8 hours	Approx. 7 days (Wallentin 2009)
Prasugrel	P2Y12 inhibitor	Oral	Irreversible	7 hours	7-10 days (Wallentin 2009)
Ticagrelor	P2Y12 inhibitor (partial P2Y1)	Oral	Reversible	7-9 hours	3-5 days
Cangrelor	ATP analogue	Intravenous	Reversible	3-6 mins	Rapid (minutes-hours)
Abciximab	GP IIb/IIIa inhibitor	Intravenous	Reversible	10-15 mins	24-48 hours
Epitifibatide	GP IIb/IIIa inhibitor	Intravenous	Reversible	2.5 hours	4-8 hours
Tirofiban	GP IIb/IIIa inhibitor	Intravenous	Reversible	2 hours	4-8 hours
Vorapaxar	PAR-1 inhibitor	Oral	Reversible	5-13 days (Gremmel and Panzer 2017)	Up to 4-8 weeks (Kosoglou*, et al* 2011)

Table 2. General risk factors associated with bleeding

Risk factors	
Patient-related factors	Surgery-related factors
Advanced age Renal disease Liver disease Elevated body mass index (BMI) Personal or family history of bleeding Known bleeding disorder Polypharmacy including antiplatelets, anticoagulants, NSAIDs, other drugs affecting haemostasis eg. ibrutinib/Bruton tyrosine kinase inhibitors, chemotherapy	Bleeding risk of surgery Bleeding risk of anaesthetic technique eg. spinal anaesthesia Elective or emergency

Table 3. The DAPT Score (Yeh 2016)

Risk Factor		Points
Age	≥75 years	-2
	65-75 years	-1
	<65 years	0
Smoking		1
Diabetes mellitus		1
MI at presentation		1
Prior PCI or MI		1
Paclitaxel-eluting stent		1
Stent diameter <3mm		1
Congestive cardiac failure or left ventricular ejection fraction <30%		2
Vein graft stent		2

High risk: ≥2; Low risk: <2

Table 4. POC platelet analysers

Test	Method	Strengths	Weaknesses
PFA-100	Whole blood is added to cartridges impregnated with collagen and adrenaline or ADP. Time required for platelet aggregation to occlude a 150 μm aperture is recorded as the closure time (CT).	Cheap Quick Sensitive to aspirin-effect, and more recent cartridges allow assessment of P2Y12-effect (Jilma and Fuchs 2001, Tsantes*, et al* 2012).	Affected by VWF levels, platelet count and anaemia Cannot assess GP IIb/IIIa inhibition (Srivastava and Kelleher 2013) Studies in cardiac surgery have shown no benefit in prediction of bleeding risk (Fattorutto*, et al* 2003).
VerifyNow	Citrated whole blood is mixed with a lyophilised peptide that activates the thrombin receptor. Activated platelets agglutinate with fibrinogen-coated beads, which fall out of suspension, producing an increase in light transmission through the sample.	Quick Can assess effects of aspirin, P2Y12 antagonists and GP IIb/IIIa inhibitors (Srivastava and Kelleher 2013)	Relatively expensive Low predictive value for post-operative bleeding risk (Alstrom*, et al* 2009).
Multiplate	Measures increases in impedance between electrodes caused by platelet aggregation following administration of a platelet activator to whole blood.	Assessment of aspirin. P2Y12 antagonists and GP IIb/IIIa inhibitors is possible, with good agreement with gold-standard light transmission aggregometry(Srivastava and Kelleher 2013) The ADP test was predictive of post-operative bleeding in 1 study in cardiac surgery (Ranucci*, et al* 2011). Multiplate with ROTEM has shown benefit in several	Requires manual pipetting by laboratory staff Results may be affected by age, coexisting inflammation and platelet count (Bolliger*, et al* 2016, Ranucci*, et al* 2016).

		other studies (Bolliger and Tanaka 2017).	
TEG-PM (platelet mapping)	Measures platelet inhibition relative to baseline global viscoelastic profile. A heparinised sample with Reptilase and Factor XIIIa generates a cross-linked fibrin clot without thrombin-mediated platelet activation. AA and ADP are then used to assess for aspirin and P2Y12-related inhibition, respectively (Srivastava and Kelleher 2013).	Results in the post-operative setting have been poor (Alstrom*, et al* 2009, Carroll*, et al* 2006), but have shown benefit pre-operatively (Mahla*, et al* 2012).	Platelet activation by thrombin is partially blocked by heparin-may lead to overestimation of ADP/aspirin-effect in cardiac surgery patients/other heparinised patients (Bolliger and Tanaka 2017)