Comparison of oral anticoagulants

Property	Warfarin	Rivaroxaban	Dabigatran etexilate
Anticoagulant action	Reduced synthesis of functional clotting factors II, VII, IX and X	Direct competitive reversible inhibition of activated factor X	Direct competitive reversible inhibition of thrombin
Prodrug	No	No	Yes
Bioavailability	Almost 100%	80%	6.5%
Onset of anticoagulant action	36–72 hours	Within 30 minutes T_{max} 2.5–4 hours	Within 30 minutes T_{max} 0.5–2 hours
Duration of anticoagulant action	48–96 hours	24 hours	24–36 hours
Elimination half-life (anticoagulant activity)	20–60 hours	5–9 hours in young adults 11–13 hours in older adults	7–9 hours in young adults 12–14 hours in older adults
Predictable pharmacokinetics	No	Yes	Yes
Interactions with diet or alcohol	Yes, clinically significant	Low potential	Low potential
Drug interactions	Numerous clinically significant interactions	Potent cytochrome P450 3A4 and P-glycoprotein inhibitors augment anticoagulant effect (e.g. ketoconazole, clarithromycin, ritonavir)	Proton pump inhibitors reduce absorption Possible interactions with P-glycoprotein inhibitors and inducers
Dosing and dose adjustments	Dose individualised for each patient, requires frequent INR monitoring and adjustment	Fixed according to clinical indication	Fixed according to clinical indication
Monitoring	INR every 1–2 weeks	No routine monitoring required	No routine monitoring required
Use in liver failure	Contraindicated or caution advised	Contraindicated as hepatic metabolism	Possibly safe as no hepatic metabolism but caution advised
Use in severe renal impairment	No dose adjustment required	Increased drug exposure and elimination half-life in renal impairment Safety and dosing not yet established Contraindicated in severe renal impairment	Increased drug exposure and elimination half-life in renal impairment Safety and dosing not yet established Contraindicated in severe renal impairment
Use in pregnancy	Category D Teratogenic in first trimester	Contraindicated as safety not established (excluded from clinical trials)	Contraindicated as safety not established (excluded from clinical trials)
Reversibility after cessation	Several days, requires synthesis of clotting factors	24 hours, dependent on plasma concentration and elimination half-life	24–36 hours, dependent on plasma concentration and elimination half-life
Antidote	Immediate reversal with plasma or factor concentrate Reversal within hours with vitamin K	None available	None available

INR international normalised ratio

T_{max} time to maximum concentration