Brief Guide to the perioperative management of NOACS

The perioperative management of NOACS (New, Novel, or Non-vitamin K Oral Anticoagulants) is a matter of ongoing debate. There are multiple detailed guidelines available.

Issues that complicate the consideration of this issue include:-

- The adequacy of reversal that is required depends on the risk of bleeding (low-risk surgery, high-risk surgery, and reversal required for neuraxial blockade)
- The risk of the patient ceasing anticoagulation may vary depending on the indication for anticoagulation. The BRIDGE trial (although focussed on Warfarin) suggests that this risk may be less than commonly thought, so that slightly earlier preoperative cessation of NOAC therapy may not imply greatly increased risk of thrombotic events.
- There has been considerable debate about the quality of evidence, data interpretation, marketing, and some 'value judgements' in the development and introduction of NOACs.
- Based on the above, some clinicians would be somewhat more cautious than the cessation times recommended in many guidelines.

Recommendations extracted from South Australian Guidelines, 2015

3. Surgery
> Consider the risk of thrombotic complications in the perioperative period if the NOAC is stopped, relative to the risk of bleeding if it is continued.
> Discontinuing the NOAC may not be essential, especially with very minor procedures.
> Time the surgery to coincide with minimal residual anticoagulant effect as per the elimination half-life of the NOAC in relation to the patient's renal function, based on calculated creatinine clearance, and the bleeding risk.

3.a. Urgent Surgery
> If possible delay surgery until coagulation screen is normal or sufficient time has passed for drug clearance.
> Seek haematologist's advice if surgery cannot be sufficiently delayed.

3.b. Pre-operative interruption of NOAC

Table 8: Suggested time between last dose of NOAC and surgery

Renal Function and related half-life*	**NOAC and current dose**	**Low bleeding risk† surgery** (2 to 3 half-lives between last dose and surgery)	**High bleeding risk‡ surgery** (4 to 5 half-lives between last dose and surgery)
		Time of last dose before surgery (hours)	**Time of last dose before surgery (hours)**
Apixaban 5mg twice daily	CrCl ≥ 50 mL/min (half-life 7 - 8 hours)	24	48-72
	CrCl 30 - 49 mL/min) (half-life 17 - 18 hours)	48	72
Rivaroxaban 20mg once daily	CrCl ≥ 50 mL/min (half-life 5 - 9 hours)	24	48-72
	CrCl 30 - 49 mL/min) (half-life 9 - 13 hours)	48	72
Dabigatran 150 mg twice daily	CrCl ≥ 50 mL/min (half-life 12 - 17 hours)	24	48-72
	CrCl 30 - 49 mL/min) (half-life 13 - 23 hours)	48-72	96

4. Neuraxial anaesthesia (or lumbar puncture)

> A patient is at risk of developing an epidural or spinal haematoma if a neuraxial procedure is undertaken when anticoagulated.

> There is a lack of published evidence regarding the safety of neuraxial anaesthesia in patients therapeutically anticoagulated with NOAC.

> Avoid neuraxial procedures until laboratory testing (if available) establishes the absence of any anticoagulant effect or wait until five renally adjusted half-lives have elapsed since the last NOAC dose.

> Always monitor carefully for signs and symptoms of neurological impairment.

> Seek specialist advice from Haematology, Anaesthesia or Acute Pain Service.