

Clinical Guideline

Perioperative bridging of warfarin in adult patients undergoing elective surgery

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Perioperative Bridging of Vitamin K Antagonists e.g. warfarin in Adult Patients Undergoing Elective Surgery



Key:

AF - Atrial Fibrillation

CVA - Cerebrovascular accident

CrCI- Creatinine clearance

DVT - Deep vein thrombosis

HIT - Heparin induced thrombocytopenia

IVC - Inferior vena cava

PE - Pulmonary embolism

TIA - Transient Ischaemic Attack

VKA – Vitamin K Antagonist e.g. warfarin/acenocoumarol/phenindione

VTE - Venous thromboembolism

(A) Low risk:

- Target INR 2.0-3.0 unless VTE with:
- Active cancer (intermediate risk)
- o VTE within last 3 months (Intermediate risk)
- O VTE within last 6 weeks (High risk)
- Non-valvular AF: Target INR 2.0 3.0 unless:
- TIA/CVA within the last 3 months (Ideally avoid surgery Intermediate risk)

(B) Intermediate risk:

- DVT/PE target INR 2.0-3.0 but VTE within the last 6-12 weeks
- Valvular AF regardless of target INR range
- TIA/CVA within the previous 3 months (ideally avoid surgery)

(C) High risk:

- VTE within the last 6 weeks Ideally avoid surgery or consider using an IVC filter
- Any indication with a target INR range of 3.0 4.0 (excludes mechanical heart valves = very high risk)

(D) Very high risk:

Mechanical heart valves – Refer to <u>Peri-operative Bridging of patients with</u> mechanical heart valves undergoing elective surgery guideline

(E) PROPHYLACTIC dalteparin dosing

Weight	CrCl 30mL/min or more	CrCl less than 30mL/min (Renal impairment) see box G
≤ 49 kg	2,500 units ONCE daily	2,500 units ONCE daily
50-99 kg	5,000 units ONCE daily	2,500 units ONCE daily
100-139 kg	7,500 units ONCE daily	5,000 units ONCE daily
140-179 kg	5,000 units TWICE daily	5,000 units ONCE daily
≥ 180 kg	Seek advice from the Thrombosis StR	

(F) TREATMENT dalteparin dosing

Weight	CrCl 30mL/min or more	CrCl less than 30mL/min
weight	(Treatment dose =	(Renal impairment) see box G
	200units/kg)	(Treatment dose = 140units/kg)
≤ 45 kg	7,500 units ONCE daily	5,000 units ONCE daily
46-56 kg	10,000 units ONCE daily	7,500 units ONCE daily
57-68 kg	12,500 units ONCE daily	10,000 units ONCE daily
69-82 kg	15,000 units ONCE daily	10,000 units ONCE daily
≥ 83kg	18,000 units ONCE daily (dose capped)	12,500 units ONCE daily

Pre-op ALL patients should take their last dose of VKA 4 days before the procedure (day -4)

Does the patient have antithrombin deficiency or antiphospholipid antibodies? Does the patient have allergies to heparin/history of HIT?

NO

Determine the patient's creatinine clearance (CrCl) (using the Cockcroft-Gault equation).

If CrCl less than 30mL/min, dose accordingly as per tables E and F. For advice on anti-Xa levels see box G

Contact the
Thrombosis StR
OR
The bridging clinic
(ext.: 82802)

Is the patient's thrombosis risk considered low risk (A), Intermediate risk (B), high risk (C) or very high risk (D)?

Low risk (A)	Intermediate risk (B)	High risk (C)	Very high risk
Pre-op:	Pre-op: Prophylactic dalteparin as per	Pre-op: Treatment dalteparin as per patient's	(D)
No alternative anticoagulation	patient's weight and renal function (See	weight and renal function (See Table F)	
required	Table E) commencing at 09:00 on days -3, -2	commencing at 09:00 on days -3, -2 and -1. Omit on	Refer to Peri-
	and -1. Omit on the morning of surgery	the morning of surgery	<u>operative</u>
Post-op: Start prophylactic	Post-op: Restart prophylactic dalteparin as	Post-op: Commence prophylactic dalteparin as per	Bridging of
dalteparin as per patient's	per patient's weight and renal function (see	patient's weight and renal function (see Table E),	patients with
weight and renal function (see	Table E).	for a maximum of 48 hours.	mechanical
table E). Administer 1st dose 6-	Administer 1st dose 6-12 hours post wound	Administer 1st dose 6-12 hours post wound closure	heart valves
12 hours post wound closure	closure if haemostasis secure*	if haemostasis secure*	undergoing
if haemostasis secure*		After 48hours, restart treatment dalteparin as per	<u>elective</u>
	Restart VKA as below (Box H)	patient's weight and renal function (see Table F)	surgery
Restart VKA as below (Box H)		,	guideline
		Restart VKA as below (Box H)	

* NB: Timing of when to restart dalteparin post-operatively is at the discretion of the surgeon if patient is at high risk of bleeding

Stop dalteparin (inpatient or outpatient) or unfractionated heparin infusion (inpatient) once VKA restarted and either:

- INR above target INR (midpoint of target range) ONCE (e.g. INR reported = 2.8. Target range = 2-3. Midpoint INR = 2.5, therefore stop bridging) OR
- INR in range but BELOW target INR on two consecutive occasions.

Check INR 24-48 hourly once oral anticoagulant restarted to avoid over anticoagulation

If traumatic epidural catheter insertion – wait 24 hours after insertion before restarting dalteparin

) Anti Xa levels – Prophylactic and Therapeutic

Anti-Xa level testing in reduced renal function and low body weight
Dalteparin can accumulate in patients with impaired renal function. There is
little data on the accumulation of dalteparin in patients with low body weight
Consider peak and trough anti Xa level testing for patients with low body
weight or in any patient with renal impairment if concerned about
bleeding/bruising after receiving dalteparin for 7 days

Peak anti Xa levels: Take level <u>4 hours</u> after dalteparin administration

Trough anti Xa levels: Take level prior to dalteparin administration

	Therapeutic <u>ONCE daily dosing</u> target range	Prophylactic target range
Peak	0.7 – 1.2 IU/mL	≤ 0.3 IU/mL
Trough	≤ 0.2 IU/mL	≤ 0.2 IU/mL
If anti-Xa levels exceed the reference range, contact the Thrombosis StR for advice		

(H) Re-starting Vitamin K Antagonists

YES

If there is no excessive bleeding (and epidural catheter has been removed), ideally restart on the evening of surgery (obtain surgical consultant/StR approval first) once oral intake established

- INR 1.5 or less: Restart with a loading dose of 1.5 x patients usual dose for 3 days, then continue
 on patients usual dose (e.g. a patient who usually takes 5mg daily should receive 7.5mg daily for
 3 days, then continue on 5mg)
- INR greater than 1.5: Contact the ward pharmacist/Thrombosis StR for advice

Note: If any medications that interact with VKA's have been started/stopped during admission, contact the ward pharmacist for advice as the usual maintenance dose may need altering

Refer patient to their local anticoagulation clinic within:

- 3 days of discharge if only one INR in range pre discharge
- 5 days of discharge if two consecutive INRs in range pre discharge

Thrombosis StR contact details: Bleep 0122 (0294 out of hours)