Pre- and peri-operative management of anticoagulated patients

Dr Barry Jackson

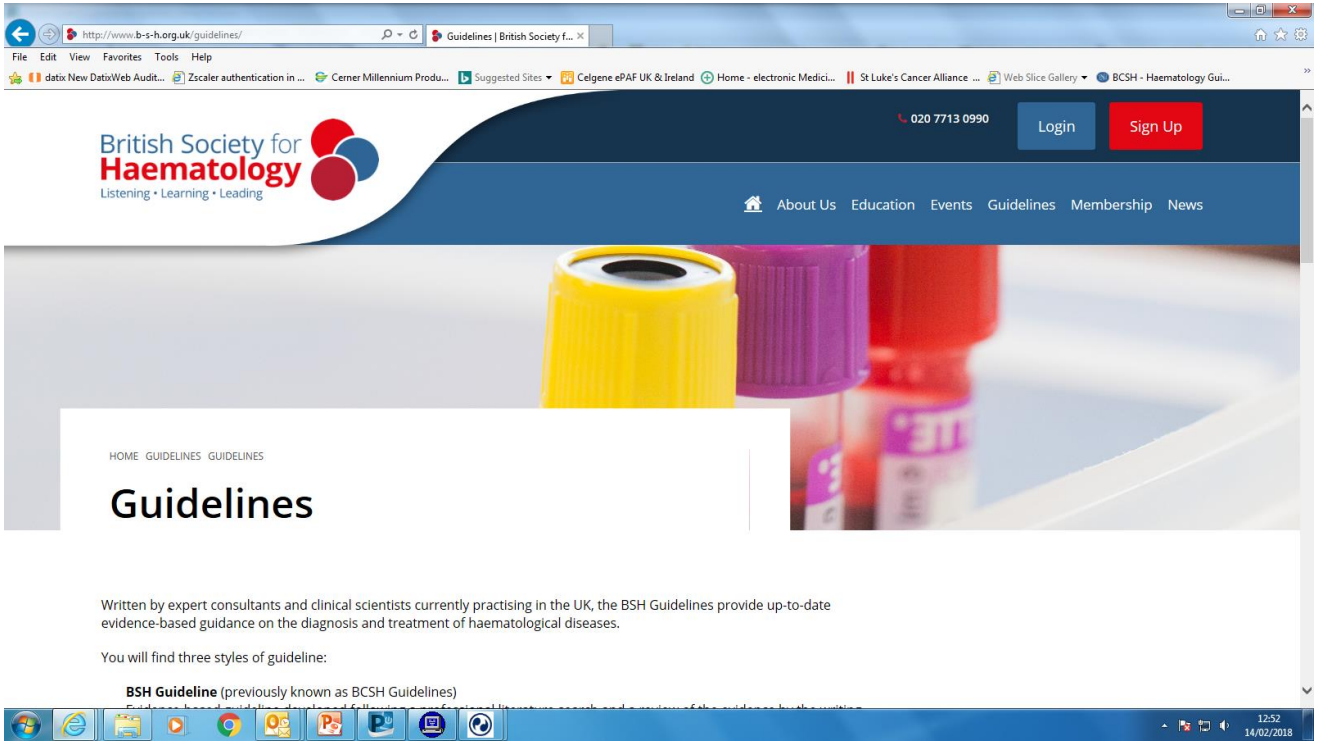
Consultant Haematologist

Surrey and Sussex NHS Trust

- Elective surgery
  - Warfarin
  - DOACs
- Emergency surgery
  - Warfarin
  - DOACs
- Antiplatelet therapy

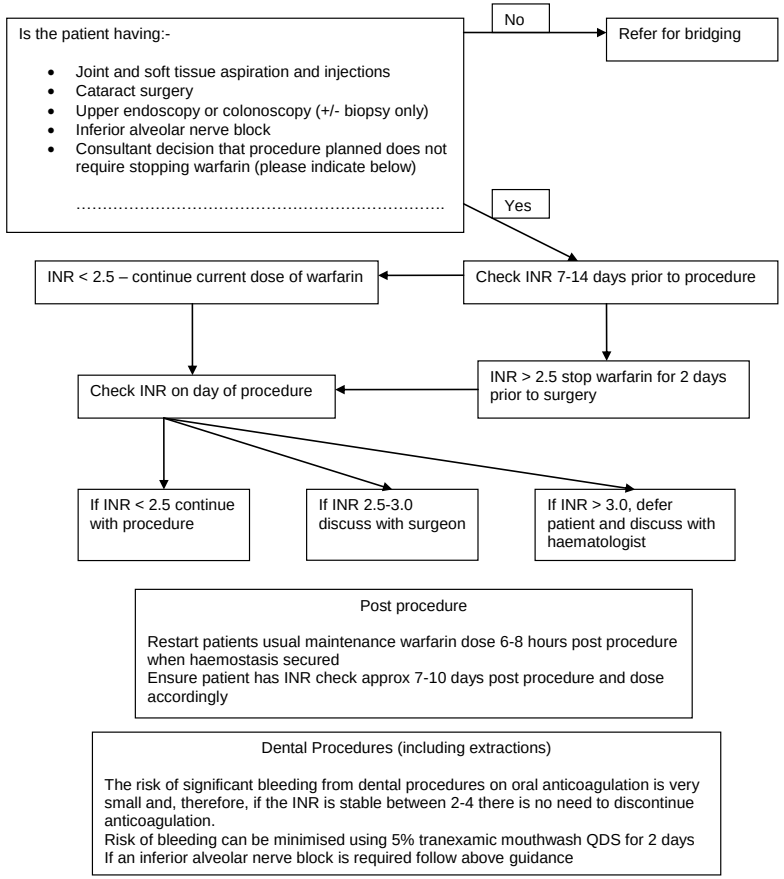
Elective Surgery

- British Society of Haematology Guidelines
  - Guidelines on oral anti-coagulation 4th ed 2011
  - Peri-operative anticoagulation Oct 2016



Warfarin

- Does warfarin need to be stopped?
  - Major surgery
  - Low risk procedures



Stopping warfarin

- When to stop
- When to restart
- Bridging

Stopping warfarin

- Half-life 36 hours
- Stop 5 days prior to surgery
- Ideally check INR 24 hours prior to surgery, allows time to give vitamin K if INR >1.5
- Check INR on day of surgery

Bridging

- Is the risk of thrombosis sufficiently high when warfarin is temporarily stopped to warrant <u>treatment dose</u> LMWH?

- Check renal function

Bridging

- VTE
- Atrial Fibrillation
- Mechanical Heart Valves

Bridging

- VTE
  - Highest risk in first 3 months and especially first month (?delay elective surgery)
- Atrial Fibrillation
- Mechanical Heart Valves

Bridging

- VTE
  - Highest risk in first 3 months and especially first month (?delay elective surgery)
- Atrial Fibrillation
  - $CHADS_2$ score
  - Bridging Required if score 5-6
  - TIA/CVA in past 3 months
- Mechanical Heart Valves

Bridging

- VTE
  - Highest risk in first 3 months and especially first month (?delay elective surgery)
- Atrial Fibrillation
  - CHADS2 score
  - Bridging Required if 5-6
  - TIA/CVA in past 3 months
- Mechanical Heart Valves
  - All valves aside from bileaflet aortic valves

Bridging

perioperative anticoagulation guideline SASH 20 11 17 [Compatibility Mode] - Microsoft Word

Guideline for the peri-operative management of oral anticoagulants

Name .....

Hospital Number .....

Date of Birth .....

Surrey and Sussex NHS Healthcare NHS Trust

1.10 PROFORMA FOR HIGH RISK WARFARIN PATIENTS NEEDING BRIDGING FOR ELECTIVE SURGERY

Indication for anticoagulation/bridging .....

Therapeutic range .....

Surgical procedure .....

Name of surgeon .....

Pre-operative assessment date .....

Pre-operative assessment nurse .....

Weight ..... Kg eGFR*.....ml/min

*eGFR must be ≥30ml/min- if <30 pt do not use this protocol, pt will need admitting for UFH

	D-14 to D-6	D-5	D-4	D-3	D-2	D-1	Procedure date	D+1	D+2	D+3/4/5
Date										
Warfarin dose		No warfarin to be taken					*	✓	✓	✓
INR test required		No need to check					✓	X	X	✓
Enoxaparin 1.5mg/kg =.....(Treatment dose) time 09:00	No need to be given		✓	✓	✓	X	X	X	✓	✓
Enoxaparin 40mg (Prophylactic dose) time 09.00	No need to be given						*	✓	X	X

*Restart warfarin (at usual maintenance dose) on the evening of the procedure together with enoxaparin 40mg at least 6 hours post op ONLY if haemostasis is secure. Continue enoxaparin until INR is in therapeutic range. Check INR day 3-5 post op

✓=Action required

Page: 10 of 29 | Words: 4,309

14:44 14/02/2018

DOACs

Renal function (CrCl, ml/min)	Estimated half-life (h)	Low bleeding risk (h)	High bleeding risk (h)
Dabigatran			
≥80	13	24	48
≥50 to <80	15	24–48	48–72
≥30 to <50	18	48–72	96
Rivaroxaban			
≥30	9	24	48
<30		48	72
Apixaban			
≥30	8	24	48
<30		48	72
Edoxaban			
≥30	10–14	24	48
<30		48	72

DOACs

Renal function (CrCl, ml/min)	Estimated half-life (h)	Low bleeding risk (h)	High bleeding risk (h)
Dabigatran			
≥80	13	24	48
≥50 to <80	15	24–48	48–72
≥30 to <50	18	48–72	96
Rivaroxaban			
≥30	9	24	48
<30		48	72
Apixaban			
≥30	8	24	48
<30		48	72
Edoxaban			
≥30	10–14	24	48
<30		48	72

DOACs

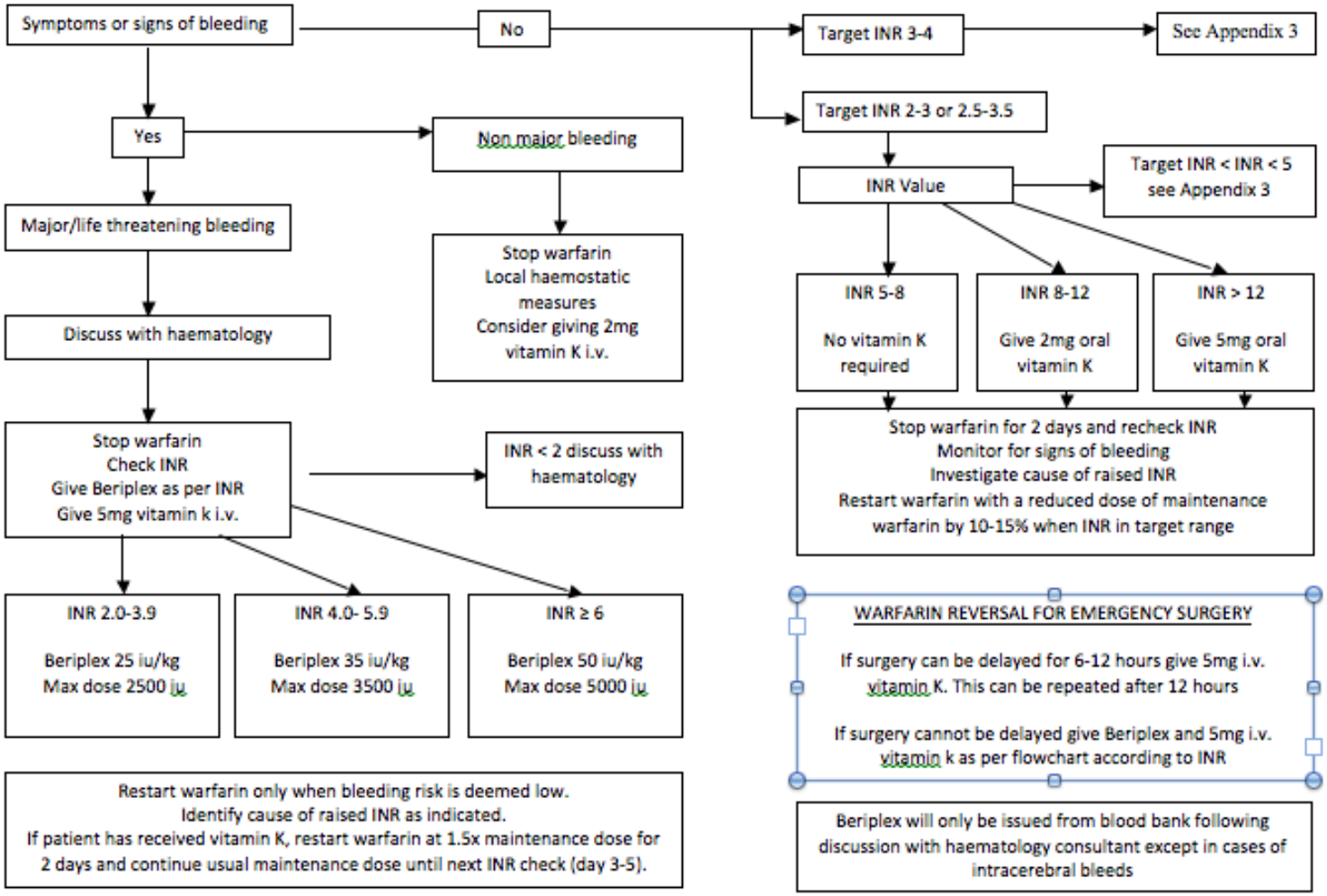
Renal function (CrCl, ml/min)	Estimated half-life (h)	Low bleeding risk (h)	High bleeding risk (h)
Dabigatran			
≥80	13	24	48
≥50 to <80	15	24–48	48–72
≥30 to <50	18	48–72	96
Rivaroxaban			
≥30	9	24	48
<30		48	72
Apixaban			
≥30	8	24	48
<30		48	72
Edoxaban			
≥30	10–14	24	48
<30		48	72

- Elective surgery
  - Warfarin
  - DOACs
- Emergency surgery
  - Warfarin
  - DOACs

Emergency surgery

- Reversal of warfarin
  - Withholding
  - Vitamin K
    - Expect to start reversing warfarin 4-6 hours after administration
  - Prothrombin Complex Concentrate (Beriplex)
    - Full immediate reversal
    - Give 5mg Vitamin K alongside
    - Dose dependent on INR and weight
    - Recheck INR 30 mins after administration
  - ?FFP

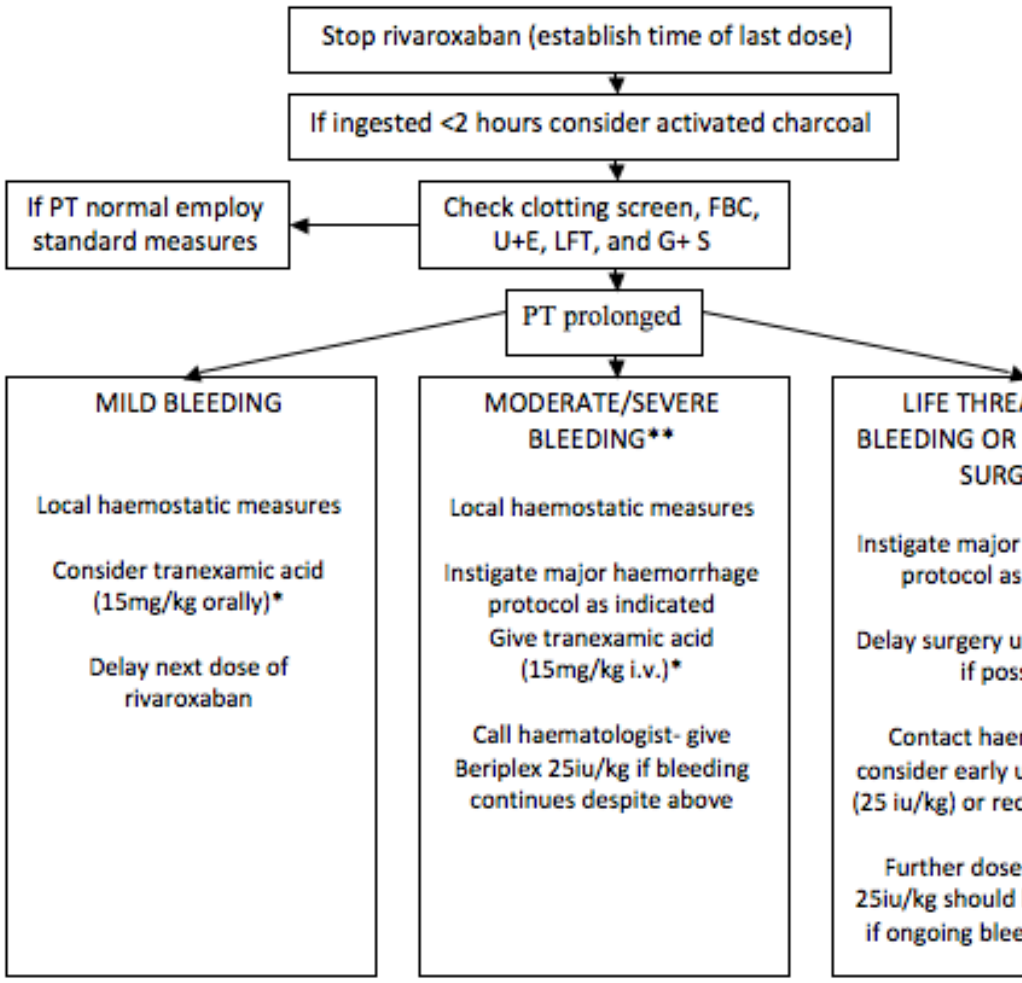
EMERGENCY REVERSAL OF WARFARIN



Emergency surgery

- DOACs
  - Can surgery be safely delayed?
  - When did they take their last DOAC
- Dabigatran
  - Praxbind
- Rivaroxaban, Edoxaban, Apixaban
  - No antidote
  - Consider PCC (or aPCC)

EMERGENCY REVERSAL OF RIVAROXABAN



There is no antidote for rivaroxaban- both vitamin K and protamine are ineffective

Half- life of rivaroxaban is 8-12 hours, prolonged in severe renal impairment

A normal PT suggests very low levels of rivaroxaban, so reversal may not be required

Rivaroxaban 65% renally excreted, therefore, maintaining BP and good urine output is vital

*There is no published data on using tranexamic acid in individuals receiving rivaroxaban

** Hb drop > 2g/L or bleeding in critical site

Antiplatelet therapy

- Elective surgery
  - When being used for secondary prevention, aspirin monotherapy can be discontinued for most invasive non-cardiac procedures, but if the perceived bleeding risk is high, aspirin can omitted from day -3 to day +7
  - If on dual antiplatelet therapy, low bleeding risk procedures should proceed without interruption and high bleeding risk procedures patients should continue aspirin and stop clopidogrel 5 days preop

Antiplatelet therapy

- Emergency surgery
  - High-bleeding risk surgery
    - Consider pre-op iv tranexamic acid
    - Benefit of platelets pre-op uncertain
    - If excessive peri- or post-op bleeding consider 2 pools of platelets

Summary

- Robust pre-operative assessment of all patients on anticoagulation
- For those patients on DOACs, delay emergency surgery if possible and not detrimental to patients health until reversal of anti-coagulation is achieved

- Further information
  - www.b-s-h.org.uk/guidelines