



CG023 Anticoagulant Reversal

1. Key Recommendations for operational use

For use by: EMRS West and North: **Internet:** Yes



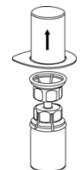
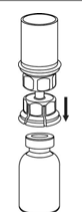
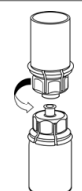

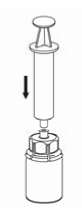
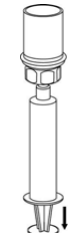
1	Indications	<ul style="list-style-type: none"> • Patient taking warfarin or a Direct Oral Anti-Coagulant (DOAC). <ul style="list-style-type: none"> - with major haemorrhage or suspected / confirmed intracranial bleeding.
2	Initial Measures	<ul style="list-style-type: none"> • Give Tranexamic Acid if indicated. • Obtain patient weight. • Measure INR and coagulation screen if possible. • Patient on Warfarin: <ul style="list-style-type: none"> - administer Vitamin K 5mg IV. • Patient on a DOAC (dabigatran / rivaroxaban / apixaban / edoxaban): <ul style="list-style-type: none"> - discuss with haematologist (at receiving centre if not locally available).
3	Additional kit	<ul style="list-style-type: none"> • Prothrombin Bag contains: <ul style="list-style-type: none"> - Prothrombin Complex Concentrate (PCC) 500 units x 10. - Vitamin K 10mg x 1. - administration accessories. - laminated instruction sheet.
4	Reversal Agents	<ul style="list-style-type: none"> • Warfarin: PCCs are licensed for treatment of bleeding in patients on warfarin. • DOACs: PCCs are sometimes used off-licence to treat bleeding in patients on DOACs. • Dabigatran: Idarucizumab is licensed for reversal of dabigatran in major or uncontrolled bleeding and may be available in some rural centres. • Rivaroxaban / Apixaban: Andexanet alfa aims to reverse effect of rivaroxaban and apixaban and may be available in some rural centres but clinical benefit is uncertain.

Recommendations for the use of PCCs

5	Contra-indications	<ul style="list-style-type: none"> • Absolute: <ul style="list-style-type: none"> - Hypersensitivity to PCC. • Relative: <ul style="list-style-type: none"> - History of heparin-induced thrombocytopenia. - Acute coronary syndrome within last 3 months. - Disseminated intravascular coagulation (DIC). • Weigh the risk of haemorrhage against risk of thrombosis due to underlying disease (e.g. mechanical heart valve). 												
6	Dosing	<ul style="list-style-type: none"> • Use EMRS iPhone app to calculate dose (max 5000 units / 200ml). • If INR unavailable use 1.4ml/kg. • Confirm dose manually before administration using the table: <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Initial INR</th> <th>2.0 - 3.9</th> <th>4.0 - 6.0</th> <th>>6.0</th> </tr> </thead> <tbody> <tr> <td>Approx. dose ml/kg</td> <td>1</td> <td>1.4</td> <td>2</td> </tr> <tr> <td>Approx. dose units/kg</td> <td>25</td> <td>35</td> <td>50</td> </tr> </tbody> </table>	Initial INR	2.0 - 3.9	4.0 - 6.0	>6.0	Approx. dose ml/kg	1	1.4	2	Approx. dose units/kg	25	35	50
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CG023 Anticoagulant Reversal

7	Preparation	<ul style="list-style-type: none"> Each package contains a solvent vial, a product vial and a “Mix2Vial” adaptor. Bring solvent to room temperature by holding in your hand. Make up solution and draw into 50ml syringes using Mix2Vial system below:
		 <ul style="list-style-type: none"> Open the Mix2Vial package by peeling off the lid. Do not remove the Mix2Vial from the blister package.
		 <ul style="list-style-type: none"> Place the solvent vial on an even, clean surface and hold tightly. Take the Mix2Vial together with the blister package and push the spike of the blue adaptor end straight down through the solvent vial stopper.
		 <ul style="list-style-type: none"> Carefully remove the blister package from the Mix2Vial set by holding at the rim and pulling vertically upwards. Only pull away the blister package and not the Mix2Vial set.
		 <ul style="list-style-type: none"> Place the product vial on an even and firm surface. Invert the solvent vial with the Mix2Vial set attached and push the spike of the transparent adaptor end straight down through the product vial stopper. The solvent will automatically flow into the product vial.
		 <ul style="list-style-type: none"> With one hand, grasp the product-side of the Mix2Vial set; with the other hand grasp the solvent-side and unscrew the set into two pieces. Discard the solvent vial with the blue Mix2Vial adaptor attached.
		 <ul style="list-style-type: none"> Gently swirl the product vial with the transparent adaptor attached until the substance is fully dissolved. Do not shake.
		 <ul style="list-style-type: none"> Draw air into an empty, sterile syringe. While the product vial is upright, connect the syringe to the Mix2Vial's Luer lock fitting. Inject air into the product vial.
		 <ul style="list-style-type: none"> Keep the syringe plunger pressed and invert the system upside down. Draw the solution into the syringe by pulling the plunger back slowly. Remove Mix2Vial adaptor by turning anticlockwise.



CG023 Anticoagulant Reversal

8	Administration	<ul style="list-style-type: none">• Check that the solution is clear, colourless and free of particulate matter.• Infuse required volume in 50ml syringe(s) through a dedicated line.• Use a syringe pump at 300ml/h.• Do not allow blood to enter syringe as clots may form.
9	Monitoring	<ul style="list-style-type: none">• If delay in transport, repeat INR 30 mins after administration.• If INR remains >1.3, consider repeat dosing following discussion with haematologist.



CG023 Anticoagulant Reversal

2. Document History			
Reference Number	CG023		
Version	1		
Writing group (Lead author in bold)	Stephen Hearn	Emergency Physician	EMRS
	Jennifer Laird	Haematologist	SNBTS
	James Patterson	Emergency Physician	EMRS
Associate Medical Director	Andrew Inglis		
Date issued	25th August 2021		
Date for review	August 2024		
Distribution	BASICS Scotland		X
	Medic 1		X
	Referring centres via service websites		✓
	Rural GPs Association of Scotland		X
	SAS	Air Ambulance	X
		Specialist Services Desk	X
	ScotSTAR	EMRS West	✓
		EMRS North	✓
		Paediatric	X
		Neonatal	X
Tayside Trauma Team		X	





CG023 Anticoagulant Reversal

3. Scope and purpose

- Overall objectives:

The aim of this guideline is to assist clinicians encountering patients with major haemorrhage or suspected intracranial bleeding who are taking oral anticoagulants. Specifically it outlines the use of Prothrombin Complex Concentrate (PCC) / Beriplex which can be carried by EMRS as required.

- Statement of intent:

This guideline is not intended to be construed or to serve as a standard of care. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. Clinicians using this guideline should work within their skill sets and usual scope of practice.

- Feedback:

Comments on this guideline can be sent to: sas.CPG@nhs.scot

- Equality Impact Assessment:

Applied to the ScotSTAR Clinical Standards group processes.

- Guideline process endorsed by the Scottish Trauma Network Prehospital, Transfer and Retrieval group.



4. References

1. Electronic Medicines Compendium. Beriplex P/N 250IU SmPC [Internet] 2021 [cited 2021 April 4] Available from <https://www.medicines.org.uk/emc/medicine/21147>
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4. National Institute for Health and Care Excellence. Acute upper gastrointestinal bleeding in over 16s: Management. 2016 [Clinical Guideline no 141] Available from <https://www.nice.org.uk/guidance/cg141>
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6. Bagot C, Coelho C. Apixaban, Edoxaban and Rivaroxaban (Factor Xa Inhibitors): Management of haemorrhage, surgery or other invasive procedures. NHSGGC Guideline Version 6. 2020
7. Tait C. Dabigatran, Management of Haemorrhage, Surgery or Other Invasive Procedures, Acute. NHSGGC guideline Version 5. 2018
8. National Institute for Health and Care Excellence. Reversal of the anticoagulant effect of dabigatran: idarucizumab. 2016 [NICE Evidence summary no 73] Available from <https://www.nice.org.uk/advice/esnm73/chapter/key-points-from-the-evidence>
9. National Institute for Health and Care Excellence. Anexanet alfa for reversing anticoagulation from apixaban or rivaroxaban. 2021 [NICE Technology appraisal no 697] Available from <https://www.nice.org.uk/guidance/ta697/chapter/1-Recommendations>