GMMMG Prescriber Support Tool: Direct Oral Anticoagulants (DOACs) for Adults

To be used in conjunction with the individual SmPC for each drug as well as the NICE decision support tool for anticoagulation therapy in atrial fibrillation.

DOCUMENT CONTROL PAGE	
Title	Greater Manchester Medicines Management Group Prescriber Decision Support Tool: Direct Oral Anticoagulants (DOACs)
Supersedes	None
Minor Amendments	This version is a technical update of the GMMMG NOAC Prescriber Decision Support Tool. Key updates in this version include: - simplification of appearance and contents to improve usability - the content has been aligned with up-to-date safety alerts and dosing information - a contents page and hyperlinks to other useful references have been added - information on surgery and minor procedures has been included, along with notes on compliance and missed dose - additional information on other indications (e.g. post joint replacement) has been added
Author	RDTC for the GMMMG Pathways and Guidelines Development Subgroup:
Ratification	GMMMG Pathways and Guidelines Development Subgroup: November 2019
Application	
Circulation	Proposed: All Greater Manchester GP Practices, Non-Medical Prescribers, Provider Organisations, LPCs
Review	November 2022

CONTENTS

RENAL FUNCTION AND DOSING OF DOACs

Creatinine clearance (CrCl) should be used to guide dosing decisions for DOACs

The MHRA has issued a Drug Safety Update on Prescribing medicines in renal impairment: using the appropriate estimate of renal function to avoid the risk of adverse drug reaction

eGFR is not recommended for DOAC dosing decisions; use of eGFR for dosing of DOACs is known to increase risk of bleeding events as a consequence of overestimating renal function

The majority of trial data for DOACs in AF is based on renal clearances calculated as CrCl; this is reflected in licensed dosing recommendations for these products.

CrCl can be estimated using the Cockcroft-Gault equation. An online calculator can be found here. You will need to know the patient's:

- **age**
- **weight***
- **gender**
- **serum creatinine**

*Extremes of weight/ muscle mass (BMI <18 kg/m^2 or >40 kg/m^2) can cause inaccuracies in estimating CrCl. This should be taken into consideration when calculating CrCl for obese patients/ those with extremes of muscle mass. **The online calculator sign-posted above can provide a modified estimate based on BMI**, **however prescribers should be aware that caution is still advised when making dosing decisions based on such estimates.**

Further information on dosing of DOACs in renal impairment can be found within this document and from the SPS.

TABLE 1:

Prevention of stroke and systemic embolism in adult patients with non-valvular atrial fibrillation (NVAF) with one or more risk factors, treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE), and prevention of recurrent DVT, and PE in adults (DVT/PE)

	APIXABAN		DABIGATRAN		EDOXABAN▼		RIVAROXABAN▼ doses of 15mg or 20mg must be taken with food	
Indication and dose[1-4] Duration of therapy and dose selection should be individualised after careful assessment of the treatment benefit against the risk for bleeding	**Treatment of DVT/ PE** *Initial dose:* **10mg BD for 7 days** *Followed by:* **5mg BD**	**Prevention of recurrent DVT/ PE** *After completing 6 months of treatment with either apixaban or another anticoagulant:* **2.5mg BD**	**Treatment of DVT/ PE** *Following treatment with a parenteral anticoagulant for ≥5 days:* **150mg BD**	**Prevention of recurrent DVT/ PE** **150mg BD**	**Treatment of DVT/ PE** *Following treatment with a parenteral anticoagulant for ≥5 days:* **60mg OD**	**Prevention of recurrent DVT/ PE** **60mg OD**	**Treatment of DVT/ PE** *Initial dose:* **15mg BD for 21 days** *Followed by:* **20mg OD**	**Prevention of recurrent DVT/ PE** *After completing 6 months of treatment with rivaroxaban or another anticoagulant:* **10mg OD or 20mg OD*** (see below)
	Prevention of stroke and systemic embolism in AF		**Prevention of stroke and systemic embolism in AF**		**Prevention of stroke and systemic embolism in AF**		**Prevention of stroke and systemic embolism in AF**	
	5mg BD		**150mg BD**		**60mg OD**		**20mg OD**	
Dose adjustments[1-5] (See section on **renal impairment** for additional recommendations)	**AF**		**All indications**		**All indications**		**Prevention of recurrent DVT/ PE**	
	Reduce to **2.5mg BD** for patients with **two** or more of the following: - ≥ 80 years - body weight ≤ 60kg - serum creatinine ≥ 133µmol/l		≥ 80 years or taking verapamil: **110mg BD** Consider reduction to **110mg BD** based on individual assessment of thromboembolic risk and risk of bleeding for any of the following: - 75-80 years old - Patients with gastritis, oesophagitis or gastroesophageal reflux - Patients at increased risk of bleeding		Patients with one or more of the following: **30mg OD** - body weight ≤ 60kg - concurrent use of ciclosporin, dronedarone, erythromycin or ketoconazole		***** For patients in whom the risk of recurrent DVT or PE is considered high, a dose of **20mg OD** should be considered. E.g: - in those with complicated comorbidities - if recurrent DVT/PE has occurred on extended prevention at 10mg OD	

<table>
<tr><th></th><th colspan="2">APIXABAN</th><th colspan="2">DABIGATRAN</th><th colspan="2">EDOXABAN▼</th><th colspan="2">RIVAROXABAN▼</th></tr>
<tr><td rowspan="4">Renal impairment [1-5]

Renal function should be checked prior to initiation. Click here for link to Cockcroft and Gault (CrCl) calculator</td><td>AF</td><td>CrCl 15-29 ml/min: 2.5mg BD</td><td rowspan="3">All indications</td><td rowspan="2">CrCl 30-50 ml/min: consider reduction to 110mg BD if patient has high risk of bleeding</td><td rowspan="3">All indications</td><td rowspan="2">CrCl 15-50 ml/min: 30 mg OD</td><td>AF</td><td>CrCl 15-49 ml/min: 15mg OD</td></tr>
<tr><td>DVT/PE</td><td>CrCl 15-29 ml/min: use with caution</td><td rowspan="2">DVT/PE</td><td>CrCl 15-49 ml/min:
After 21 days of treatment (15mg BD) consider reduction to 15mg OD.
After 6 months of treatment (15mg OD), consider reduction to 10mg OD*</td></tr>
<tr><td>All indications</td><td>CrCl ≤15 ml/min: not recommended†</td><td>CrCl <30 ml/min: contraindicated†</td><td>CrCl ≤15 ml/min: not recommended†</td><td>All indications</td><td>CrCl ≤15 ml/min: not recommended†</td></tr>
<tr><td colspan="8">†Warfarin may be an alternative treatment choice if CrCl < 15ml/min; discuss treatment choice with a specialist.</td></tr>
<tr><td>Obesity[6]</td><td colspan="8">DOACs should not be used in patients with a BMI > 40 kg/m² or a weight > 120kg due to the risk of under-dosing. In these patients warfarin may be a more suitable option.</td></tr>
<tr><td>Contraindications [1-4]</td><td colspan="8">- Hypersensitivity to the active substance or any of its excipients.
- Clinically significant active bleeding
- A lesion or condition, if considered a significant factor for major bleeding
- Co-administration with other anticoagulants, except under specific circumstances (e.g. switching to warfarin).
- Antiphospholipid syndrome; there is a risk of recurrent thrombotic events. See MHRA DSU.</td></tr>
<tr><td></td><td colspan="2">APIXABAN</td><td colspan="2">DABIGATRAN</td><td colspan="2">EDOXABAN▼</td><td colspan="2">RIVAROXABAN▼</td></tr>
<tr><td></td><td colspan="2">- Hepatic disease associated with coagulopathy and clinically relevant bleeding risk.
- Not recommended if CrCl <15ml/min†</td><td colspan="2">- Hepatic impairment or liver disease expected to have any impact on survival
- Prosthetic heart valves requiring anticoagulation. See MHRA DSU.
- Concurrent treatment with the following strong P-gp inhibitors: systemic ketoconazole, cyclosporin, itraconazole, dronedarone.
- not recommended if CrCl <30ml/min</td><td colspan="2">- Hepatic disease associated with coagulopathy and clinically relevant bleeding risk
- Uncontrolled severe hypertension
- Pregnancy and breastfeeding
- Not recommended if CrCl <15ml/min†
- There is a trend towards lower efficacy with increasing CrCl (vs. warfarin). Edoxaban should only be used in high CrCl after careful evaluation of the individual thromboembolic and bleeding risk</td><td colspan="2">- Hepatic disease associated with coagulopathy and clinically relevant bleeding risk, including patients with Child Pugh B & C
- Pregnancy and breastfeeding
- Concurrent treatment with azoles, HIV protease inhibitors, strong inhibitors of both CYP3A4 and P-gp, or strong inducers of CYP3A4
- Transcatheter aortic valve replacement (TAVR). See MHRA DSU.
- Not recommended if CrCl <15ml/min†</td></tr>
</table>

	APIXABAN	DABIGATRAN	EDOXABAN▼	RIVAROXABAN▼
Hepatic Impairment[1-4]	**LFTs should be checked prior to initiation.** - Caution advised in patients with mild or moderate hepatic impairment,and those with elevated ALT / AST > 2 times the upper limit of normal or total bilirubin ≥ 1.5 times the upper limit of normal. - **Not recommended in severe hepatic impairment.**	**LFTs should be checked prior to initiation.** - Not recommended in patients with elevated liver enzymes > 2 times the upper limit of normal. - **Not recommended in patients with hepatic impairment or liver disease expected to have any impact on survival.**	**LFTs should be checked prior to initiation.** - Caution advised in patients with elevated ALT / AST > 2 times the upper limit or total bilirubin ≥ 1.5 times the upper limit. - **Not recommended in patients with severe hepatic impairment.**	**LFTs should be checked prior to initiation.** - **Not recommended in hepatic disease associated with coagulopathy and clinically relevant bleeding risk, including patients with Child Pugh B and C.**
Conversion from warfarin to DOAC[1-4]	Discontinue warfarin and start apixaban when the INR < 2.0.	Discontinue warfarin and start dabigatran when INR < 2.0.	Discontinue warfarin and start edoxaban when the INR < 2.5.	Discontinue warfarin and start rivaroxaban when: - INR ≤ 3.0 for AF and treatment of DVT / PE. - INR ≤ 2.5 for prevention of recurrent DVT / PE.
Conversion from DOAC to warfarin[1-4] (Administration of DOACs can impact INR values. Until DOAC is stopped interpret these with caution)	Continue with apixaban for at least 2 days after starting warfarin therapy. Check INR after two days of concurrent anticoagulation. Obtain INR before next schedule dose of apixaban. Continue concurrent anticoagulation until the INR ≥ 2.0 then discontinue apixaban.	**CrCL ≥50mL/min** – Start warfarin three days before discontinuing dabigatran. **CrCL ≥30- <50mL/min** – Start warfarin two days before discontinuing dabigatran.	For patients on **60mg dose** – co-administer edoxaban 30mg daily with warfarin. Those on **30mg dose** – co-administer edoxaban 15mg with warfarin. Stop edoxaban when INR ≥ 2.0. **Patients should not take a loading dose of warfarin in order to promptly achieve a stable INR.** It is recommended that during the first 14 days of concomitant therapy the INR is measured at least 3 times just prior to taking the daily dose of edoxaban to minimise the influence of edoxaban on INR measurements.	Continue rivaroxaban and start warfarin using standard initial dosing for the first 2 days. (Dosing to be guided by INR testing thereafter). Continue concurrent anticoagulation until the INR ≥ 2.0 then discontinue rivaroxaban. INR should be tested no earlier than 24 hours after the previous dose of rivaroxaban (but prior to the next dose). Once rivaroxaban is discontinued, INR testing may be done reliably at least 24hours after the last dose.

	APIXABAN	DABIGATRAN	EDOXABAN▼	RIVAROXABAN▼
Suggested monitoring requirements[1-4,8] ****Cockcroft and Gault formula should be used for dosing and monitoring **Click here** for link to Cockcroft and Gault (CrCl) calculator	Prior to initiating treatment Renal function**, LFTs, body weight, clotting screen, FBC, BP Ongoing monitoring Renal function, - **CrCl > 60 ml/min:** every 12 months - **CrCl 30-60 ml/min:** every 6 months - **CrCl 15-30 ml/min:** every 3 months LFTs & FBC every 12 months	Prior to initiating treatment Renal function**, LFTs, clotting screen, FBC, BP Ongoing monitoring Renal function, - **CrCl > 60 ml/min:** every 12 months - **CrCl 30-60 ml/min, > 75 years or fragile:** every 6 months LFTs & FBC every 12 months	Prior to initiating treatment Renal function**, LFTs, body weight, clotting screen, FBC, BP Ongoing monitoring Renal function, - **CrCl > 60 ml/min:** every 12 months - **CrCl 30-60 ml/min, > 75 years or fragile:** every 6 months - **CrCl 15-30 ml/min:** every 3 months LFTs & FBC every 12 months, or every 6 months if patient >75 years, or fragile.	Prior to initiating treatment Renal function**, LFTs, body weight, clotting screen, FBC, BP Ongoing monitoring Renal function, - **CrCl > 60 ml/min:** every 12 months - **CrCl 30-60 ml/min:** every 6 months - **CrCl 15-30 ml/min:** every 3 months LFTs & FBC every 12 months
	More frequent monitoring may be indicated depending on patient specific risk factors; e.g. rapidly declining renal function.			
NICE Decision Support Tool for AF	NICE in collaboration with Keele University have produced a decision support tool designed to assist UK healthcare professionals in the appropriate prescribing of anticoagulation therapy for the prevention of stroke in patients with **atrial fibrillation**. This tool will calculate the stroke risk (CHA_2DS_2VASc) as well as the bleeding risk (HAS BLED). This tool can only be used in patients with AF (not for patients with DVT/PE or recurrent DVT/PE).			
Counselling points[9]	• Unlike warfarin regular blood tests to calculate INR are not needed. However blood tests to monitor how well the kidney and liver are working are required. Compliance will be also be monitored and if they are experiencing any side effects. • The effect of this medicine is reduced 12 to 24 hours after the last dose (12 hours for a twice daily preparation, 24 hours for a once daily preparation). There is a risk of a clot if doses are missed. • Not to stop taking this medication abruptly without discussing with a healthcare professional, unless there are symptoms of bleeding (see following point). • To seek medical attention if they develop spontaneous bleeding that does not stop or recurs. This includes bruising, bleeding gums, prolonged bleeding from cuts, nosebleeds, blood in the urine or stools, coughing up blood and sudden severe back pain. • Avoid OTC anti-inflammatory medications such as ibuprofen. Always check with their pharmacist when buying medicines over-the-counter or if they wish to take herbal/complementary medicines as there may be a risk of interaction. • To carry their anticoagulation alert card with them at all times (e.g. in their purse or wallet). • Advice on what to do if there has been a missed dose or dosing error (see page 10 for specific information).			

<table>
<tr><td>Use with antiplatelet drugs[7,15]</td><td colspan="4">Combination use of NOACs and antiplatelets needs careful consideration of risk versus benefit (e.g. bleeding risk, stroke risk and risk of acute coronary syndrome (ACS). There should be an individualised approach for each patient depending on patient characteristics. All patients should have a plan from their cardiologist regarding the length of treatment for antiplatelets in combination with anticoagulants.

In patients with an indication for oral anticoagulation who have an ACS:

• <u>If treated with coronary stent implantation</u>, then triple therapy with aspirin, clopidogrel, and oral anticoagulant should be considered for a minimum of 1 month post stenting. Triple therapy for up to 3 months may be considered for patients at high risk of stroke and low bleeding risk. Dual therapy with clopidogrel and oral anticoagulant should follow after triple therapy.
• <u>If not treated with coronary stent implantation</u>, dual therapy with aspirin or clopidogrel plus an oral anticoagulant should be considered for up to twelve months.
• <u>At 12 months post ACS</u> (with or without stent implantation), discontinuation of antiplatelet treatment should be considered and patient maintained on NOAC monotherapy

Proton pump inhibitors should be co-prescribed for patients receiving dual antiplatelet therapy (DAPT) and anticoagulant to reduce risk of bleeding complications.</td></tr>
<tr><td rowspan="2">Administration[1-4]</td><td colspan="4">DOACs have shorter half-lives than warfarin therefore missed doses may result in more time without any anticoagulation and greater risk of thromboembolic complications. Compliance should be assessed every 3 months.[9]</td></tr>
<tr><td>APIXABAN</td><td>DABIGATRAN</td><td>EDOXABAN▼</td><td>RIVAROXABAN▼</td></tr>
<tr><td></td><td>Apixaban should be taken with water, with or without food.</td><td>Dabigatran can be taken with or without food.
Capsules should be swallowed whole with a glass of water (to facilitate delivery to the stomach).
Capsules should not be opened as this may increase the risk of bleeding.</td><td>Edoxaban can be taken with or without food.</td><td><u>Doses of 20mg or 15mg tablets must be taken with food</u>. If taken on an empty stomach, oral bioavailability of 20mg and 15mg may be reduced by a third.

Rivaroxaban 2.5 mg and 10 mg tablets can be taken with or without food.</td></tr>
<tr><td>Compliance Aid[11-13]</td><td>The manufacturer does not, or cannot recommend use in a compliance aid but there are no theoretical concerns.</td><td>Not suitable for a compliance aid; theoretical risk that the preparation is very sensitive to moisture. Dabigatran should be left in individual foil wrapping until administration.</td><td>Use in compliance aids has not been studied.</td><td>The manufacturer does not, or cannot recommend use in a compliance aid but there are no theoretical concerns.</td></tr>
<tr><td>Swallowing Difficulties[1-4,10]</td><td>Tablets can be crushed and mixed in water, 5% dextrose in water or apple juice / apple puree and are stable for up to 4 hours. (Licensed administration).</td><td>Capsules should not be opened. Consider alternative anticoagulant in patients with swallowing difficulties.</td><td>Tablets can be crushed and mixed with water or apple sauce (unlicensed administration).</td><td>Tablets can be crushed and mixed with water or apple puree. Crushed tablets should be immediately followed by food. (Licensed administration).</td></tr>
</table>

	APIXABAN	DABIGATRAN	EDOXABAN▼	RIVAROXABAN▼
Missed Dose/ dosing errors[2,4,14]	If a dose is missed and there is more than six hours to your next dose, take the missed dose immediately. Take the next scheduled dose as normal If a dose is missed and there is less than six hours to your next dose, skip the dose you missed and then continue with twice daily intake as before. **The dose should not be doubled within the same day to make up for a missed dose.** If you accidentally take a double dose, skip your next scheduled dose and take the following dose the next day as scheduled.	If a dose is missed and there is more than six hours to your next dose, take the missed dose immediately. Take the next scheduled dose as normal. If a dose is missed and there is less than six hours to your next dose, skip the dose you missed and then continue with twice daily intake as before. **The dose should not be doubled within the same day to make up for a missed dose.** If you accidentally take a double dose, skip your next scheduled dose and take the following dose the next day as scheduled.	If a dose is missed, the dose should be taken immediately and then be continued the following day with the once-daily intake as recommended. **The dose should not be doubled within the same day to make up for a missed dose.**	<u>Maintenance dose (once daily doses):</u> If a dose is missed and there is more than twelve hours to the next dose, the missed dose should be taken immediately. Take the next scheduled dose as normal. If there is less than twelve hours to the next dose, skip the dose that was missed and take the next scheduled dose as normal. **The dose should not be doubled within the same day to make up for a missed dose.** <u>Loading dose (twice daily doses):</u> If a dose is missed during the treatment phase, the dose should be taken immediately to ensure intake of 30mg per day. In this case two 15mg tablets may be taken at once. Continue with the regular 15mg twice daily dose as recommended on the following day. If you accidentally take a double dose one day, take the next scheduled dose as normal.

Surgery & minor procedures[7]

For surgical and minor procedures, it is the responsibility of the clinician performing the intervention to decide if treatment interruption is required and advise the patient appropriately.

Decisions around withholding a DOAC for surgery will depend on:

- the patient's risk of having a thromboembolic event
- the bleeding risk associated with the procedure
- patient characteristics (e.g. age, history of bleeding complications, concomitant medication, and kidney function)
- If there is a high likelihood of thromboembolism associated with withholding the DOAC, bridging therapy with a low molecular weight heparin (LMWH) should be considered.

Classification of elective surgical interventions according to bleeding risk[7]

Minor bleeding risk procedure – e.g. simple dental extraction (1-3 teeth), cataract or glaucoma intervention, endoscopy without biopsy or resection, superficial dermatological surgery

Low bleeding risk procedure – e.g. endoscopy with biopsy, biopsy of prostate or bladder, catheter ablation (except complex), non-coronary angiography, pacemaker or ICD implantation (unless complex)

High bleeding risk procedure – e.g. complex endoscopy (e.g. polypectomy, ERCP with sphincterotomy), spinal or epidural anaesthesia, lumbar diagnostic puncture, thoracic or abdominal surgery, biopsy of liver or kidney, transurethral prostrate resection, major orthopaedic surgery

TIMING OF LAST DOAC DOSE PRIOR TO ELECTIVE INTERVENTION FOR PATIENTS WITH AF

The suggestions below are adapted from European Heart Rhythm Association (EHRA) Practical Guide on NOACs in AF[7] *and therefore may not be applicable to DOAC use for all indications*[Ω]*. Decisions on withholding DOACs should be made on a case by case basis.*

CrCl (mL/min)	APIXABAN		DABIGATRAN		EDOXABAN▼		RIVAROXABAN▼	
	Low risk	High risk	Low risk	High risk	Low risk	High risk	Low risk	High risk
≥80	≥24 h	≥48 h	≥24 h	≥48 h	≥24 h	≥48 h	≥24 h	≥48 h
50–79	≥24 h	≥48 h	≥36 h	≥72 h	≥24 h	≥48 h	≥24 h	≥48 h
30–49	≥24 h	≥48 h	≥48 h	≥96 h	≥24 h	≥48 h	≥24 h	≥48 h
15–29	≥36 h	≥48 h	Not indicated	Not indicated	≥36 h	≥48 h	≥36 h	≥48 h
<15	No licensed indication for use							

Minor bleeding risk: in patients with AF the EHRA recommends the intervention should be performed at DOAC trough level (i.e. 24 hours after last dose for a once daily preparation, or 12 hours after last dose for a twice daily preparation) and restart 6 hours after the intervention providing there are no unexpected bleeding complications.

[Ω]**Where the DOAC is used for treatment or extended prophylaxis for DVT/PE, the risk profile associated with interrupting therapy may differ. Further information for these indications and on DOACs in the perioperative period in general can be found in The Handbook of Perioperative Medicines.**

TABLE 2: Additional information for other licensed indications					
	APIXABAN	**DABIGATRAN**	**RIVAROXABAN▼**		
Indications[5,15,16-18]	**Prevention of VTE post hip or knee replacement**	**Prevention of VTE post hip or knee replacement**	**Prevention of VTE post hip or knee replacement**	**Post ACS**	**In coronary artery disease (CAD or symptomatic peripheral artery disease (PAD) at high risk of ischaemic events**
Dose[5,16-18]	**2.5mg BD** Starting 12 to 24 hours after surgery	**110mg** as a single dose 1 to 4 hours after surgery, then **220mg OD** starting 24 hours after surgery	**10mg OD** starting 6 to 10 hours after surgery	**2.5mg BD** (in combination with aspirin or aspirin + clopidogrel)	**2.5mg BD** (in combination with aspirin)
Dose adjustments[5,16-18]	**None required** Use with caution in patients with severe renal impairment (CrCl 15-29ml/min)	**≥ 75 years old, taking verapamil, amiodarone, quinidine, or CrCl 30-50ml/min:** **75mg** starting 1 to 4 hours after surgery, then **150mg OD** starting 24 hours after surgery **If moderate renal impairment (CrCl 30-50ml/min) and taking verapamil:** consider dose reduction to 75mg daily.	**None required** Use with caution in patients with severe renal impairment (CrCl 15-29ml/min)	**None required** Use with caution in patients with severe renal impairment (CrCl 15-29ml/min)	**None required** Use with caution in patients with severe renal impairment (CrCl 15-29ml/min)
Duration of therapy[5,16-18]	Hip replacement: **32-38 days** Knee replacement: **10-14 days**	Hip replacement: **28-35 days** Knee replacement: **10 days**	Hip replacement: **35 days** Knee replacement: **14 days**	**12 months** Extension of treatment beyond 12 months should be done on an individual patient basis as experience up to 24 months is limited	**To be determined individually for each patient based on risk benefit profile and regular evaluations**

Edoxaban has only two licensed indications and therefore is not included in the table above[4]

USEFUL LINKS

Specialist Pharmacy Service

- Is it safe to take herbal medicines with non-vitamin K antagonist oral anticoagulants (NOACs)?
- NOACs and Antidepressants – What are the risks of using these together and how should there risks be managed?
- Can small volume intramuscular injections be given to patients taking oral anticoagulants?
- Safety in Lactation: Drugs for thromboembolic disorders
- Direct Acting Oral Anticoagulants (DOACs) in Renal Impairment : Practice Guide To Dosing Issues

European Society of Cardiology

- ESC guidelines for the management of atrial fibrillation developed in collaboration with EACTS
- Novel Oral Anticoagulants for Atrial Fibrillation

MHRA Drug Safety Updates

- Rivaroxaban (Xarelto▼): reminder that 15 mg and 20 mg tablets should be taken with food
- Prescribing medicines in renal impairment: using the appropriate estimate of renal function to avoid the risk of adverse drug reactions
- Rivaroxaban (Xarelto▼) after transcatheter aortic valve replacement: increase in all-cause mortality, thromboembolic and bleeding events in a clinical trial
- New oral anticoagulants apixaban (Eliquis▼), dabigatran (Pradaxa) and rivaroxaban (Xarelto▼) Risk of serious haemorrhage—clarified contraindications apply to all 3 medicines
- Direct-acting oral anticoagulants (DOACs): increased risk of recurrent thrombotic events in patients with antiphospholipid syndrome
- Dabigatran (Pradaxa▼): risk of serious haemorrhage
- Dabigatran (Pradaxa): contraindicated in patients with prosthetic heart valve(s) requiring anti-coagulant treatment

UKCPA

- The Handbook of Perioperative Medicines – Direct Oral Anticoagulants

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