NHS North West Coast Clinical Networks

NHS Cheshire and Merseyside

Protocol for Medicine Optimisation Reviews for Direct-Acting Oral Anticoagulants (DOACs) in Atrial Fibrillation (AF)

Applies to:

Pharmacists and GPs working in an NHS Healthcare Trust or Place.

This protocol is produced by Cheshire and Merseyside Integrated Care Board (ICB).

Aims:

- To support medicine optimisation reviews of patients currently prescribed a DOAC for AF to improve the quality and safety of patient care.

Background:

Direct-acting oral anticoagulants (DOACs) or non-vitamin K antagonist oral anticoagulants (NOACs) are an alternative anticoagulant to prevent strokes in patients with Atrial Fibrillation (AF). All patients with the following should be considered for an oral anticoagulant (NICE, 2021):

- symptomatic or asymptomatic paroxysmal, persistent or permanent atrial fibrillation
- atrial flutter
- a continuing risk of arrhythmia recurrence after cardioversion back to sinus rhythm

The Cheshire and Merseyside (C+M) Integrated Care Board (ICB) are encouraging Direct Oral Anticoagulant (DOAC) medicine optimisation (MO) reviews of patients currently receiving a DOAC or non-vitamin K antagonist oral anticoagulant (NOAC) for stroke prevention in AF. It is recognised that the DOAC MO may not currently be in funded planned work within PCNs.

Patients on a DOAC for AF should have a medicine optimisation review to ensure their existing DOAC is appropriate according to recent bloods and weight. Patients prescribed any oral anticoagulant (OAC) should discuss the options with a healthcare professional at least once a year (NICE, 2015). Adherence and compliance should be assessed regularly to support patients to take medication appropriately and safely. Stroke and bleeding risk will change over time and should be recalculated at least annually. Blood monitoring including haemoglobin (Hb), liver and renal function should be monitored at least annually, and more regularly in people with renal dysfunction, over the age of 75 years or those who are frail. The European Heart Rhythm Association Practical Guide on the use of DOACs in Patients with AF (Steffel et al., 2021) recommends monitoring as per table 1 (see Appendix 1).

Currently, all DOACs (apixaban, rivaroxaban, edoxaban and dabigatran are recommended as options for anticoagulation in the NICE AF Guidelines (NICE, 2021) considering individual patient bleeding risks and co-morbidities. NHS England (NHSE) recently updated the Commissioning Guidance (England, 2024) for DOACs recommending that the best value

DOAC should be used first line where clinically appropriate, consistent with NICE guidance (NICE, 2021). Currently the best value DOAC is apixaban. If a once daily preparation is required, rivaroxaban is the best value DOAC.

DOAC MO reviews undertaken since 2022 have been shown to improve patient safety outcomes by ensuring patients are on the correct DOAC and dose. Service evaluation across Cheshire and Mersey identified that 23% of patients on a DOAC were on an incorrect dose which can increase the risk of stroke or serious bleeding requiring hospitalisation. Analysis showed that there was no increased risk of hospitalisation due to a clotting disorder of bleeding in those patients reviewed and switched to another DOAC. Numerically there was a lower bleeding and stroke rate in the patients who had a DOAC MO review than those who did not have a DOAC MO review although patient numbers were too low to show statistical significance.

Previous NHSE commissioning guidance recommended using edoxaban first line due to a national rebate scheme making edoxaban significantly cheaper. Previous increased use of edoxaban generated significant savings across Cheshire and Mersey. Apixaban has become generically available earlier than predicted due to a high court ruling invalidating the original patent for Eliquis (apixaban). Generic apixaban is significantly cheaper than other DOACs currently available. Generic rivaroxaban is now also available at a reduced cost.

There are no head-to-head comparative trials that demonstrates that one DOAC is significantly better than another and treatment should be based on individual patient factors and bleeding risk. Patients newly diagnosed with AF who require anticoagulation should be initiated on apixaban unless there is a clinical reason to use warfarin or another DOAC. NHS Cheshire and Mersey ICB recommend that the routine DOAC MO reviews should continue to be undertaken.

Objectives:

- To optimise the care of patients on a DOAC.
- To identify patients in whom a DOAC is not appropriate.
- To identify patients in whom the dosage of DOAC prescribed needs amending: either increasing or decreasing.
- To identify patients who need (additional) monitoring.
- To identify patients on interacting medication and change as appropriate.
- To identify patients on concomitant antiplatelet and/or anticoagulants and adjust treatment accordingly.
- To review patient concordance with treatment and counsel accordingly.

Rationale:

To ensure that all patients are on an appropriate DOAC and dose regime for their individual renal function, age, liver function, weight, co-morbidities and medication, to ensure optimal oral anticoagulant (OAC) therapy.

Inclusions:

- All patients with AF prescribed a DOAC should be reviewed to ensure medicine optimisation of their DOAC and amended accordingly, if appropriate. DOAC MO reviews should be routinely undertaken according to guidance.

Exclusions:

- Patients on a DOAC for another documented indication other than AF.

Responsibilities:

To be agreed at Place level.

- Each practice should determine whether a pharmacist or GP will undertake the optimisation reviews of DOACs. The method has been written as per a pharmacist review.

- Pharmacy technicians could be responsible for running the EMIS search and report, as per protocol and highlighting patients with any outstanding monitoring to the pharmacist or GP.

- The pharmacist or GP is responsible for undertaking the reviews, as per protocol and training provided.

- The pharmacist or GP undertaking the review is responsible for ensuring the patient has given verbal consent, which is documented in the PMR, if further advice needs to be sought from a specialist external to the GP practice.

- The GP is responsible for agreeing for the work to be carried out in the practice, ensuring all monitoring and values are up to date and for following up any patients identified during the project that require further review.

Other Useful Resources and Links:

Electronic Medicines Compendium for DOAC SPCs EMC

Refer to local Formulary and guidance

Appendix 1 - Table 1: Monitoring required for DOACs

Appendix 2

- Table 2: - CHA_2DS_2-VASc (Lip et al., 2010) clinical risk stratification for predicting the risk of stroke and thromboembolism

- Table 3: HAS-BLED (Pisters et al., 2010) - – Assessment of bleeding risk in patients with atrial fibrillation

- Table 4: ORBIT (O'Brien et al., 2015) – Simple bedside score to assess bleeding risk in AF

- Table 5: Risk Categories and Bleeding Events of ORBIT and HAS-BLED

Appendix 3 – Table 6 – Prescribing parameters for all DOACS

Appendix 4 – Table 7 of interactions with DOACs

Appendix 5 – Checklist for patient/carer consultation

Appendix 6 – Decision Aid for Medicines Optimisation Review of Patients Prescribed Apixaban

Appendix 7 – EMIS search/report and how to apply

Appendix 8 – EMIS template and how to import to EMIS

Appendix 9 – Link to patient information leaflet regarding switching DOACs for patients with AF

Method:

Action	Who is responsible
DOAC Review	
1. Gain agreement from the GP practice to run the EMIS search and report and to review all patients with AF prescribed DOACs, as per protocol. Gain agreement from the GP practice to review patients prescribed a DOAC and agree with action to be taken if outstanding monitoring is identified. Note: Generic apixaban is the best value DOAC. C+M ICB recommend that routine DOAC MO reviews should continue to be undertaken.	**Pharmacist / GP**
2. Notify the Local Pharmaceutical Committee (LPC) and GP practice staff of work being undertaken.	**Pharmacist/ Technician**
3. Run the approved EMIS search and reports to identify all patients in the practice on existing DOAC therapy – edoxaban, apixaban, rivaroxaban or dabigatran who also have a code for AF or atrial flutter.	**Technician**
4. Check EMIS report to see if monitoring of U+E's, FBC, LFTs, BP*, HR* and actual body weight are within the preceding 3 months and if not, highlight any required monitoring to the GP practice or action as agreed by the GP practice. Review each patient once all values** have been received and documented in the patient's medical record (PMR). Each practice should consider how best to recall patients for monitoring. Factors to consider include: • Number of patients • How and when the medicines management team will check that monitoring is complete • How to update the patient list as patients join and leave the practice ***NB: consider if HR >100 bpm, refer to GP for rate control. BP consistently above 140/90 should be discussed with GP or reviewed according to local guidelines.** ****NB: as per local reference ranges**	**Pharmacist/ Technician**
5. The EMIS report highlights patients with the following: • Possible valvular heart disease • Possible unlicensed indications for DOAC treatment • History of thromboembolism • Two oral anticoagulants on current medication **NB. If you identify that a patient is currently taking a DOAC for an indication other than AF it is good practice to confirm the dose and duration of treatment is appropriate.**	**Technician**
In consultation, run the EMIS DOAC Review Template (see Appendix 8 for how to install)	

6. Calculate and update the CHA_2DS_2-VASc score using the EMIS calculator **NB: Patients with a CHA_2DS_2-VASc =1 in men or =2 in women should be <u>considered</u> for an oral anticoagulant (OAC).** **Patients with a CHA_2DS_2-VASc score ≥2 in men and ≥3 in women:** **It is <u>recommended</u> that these patients should be prescribed an OAC.**	**Pharmacist**
7. Calculate and update the HAS-BLED score using table 3 in Appendix 2, to assess the risk of bleeding in people on anticoagulation. NICE AF Guidelines (NICE., 2021) recommends using the ORBIT score to calculate the risk of bleeding. Until this is embedded into EMIS it is acceptable to continue using the HAS-BLED score or calculate both scores to make an informed decision (see below). MD+CALC can be used to calculate risk scores CHA_2DS_2-VASc Score for Atrial Fibrillation Stroke Risk (mdcalc.com) Refer to GP if clarification needed for modification, monitoring or advice, if there is no documentation that the following risk factors have been considered: • Uncontrolled hypertension (>160 mm Hg systolic) • Concurrent medication that will increase bleeding risk; ➢ Anti-platelet medication e.g. aspirin ➢ Non-steroidal anti-inflammatory drugs (NSAIDs) ➢ SSRI's or SNRI's • Harmful alcohol consumption above national recommendations (if noted on PMR) Calculate the ORBIT score using Appendix 2, table 4 Offer monitoring and support to modify risk factors for bleeding, including: • uncontrolled hypertension (see NICE's guideline (NICE., 2023) on hypertension in adults) • concurrent medication, including antiplatelets, selective serotonin reuptake inhibitors (SSRIs) and non-steroidal anti-inflammatory drugs (NSAIDs) harmful alcohol consumption (NICE, 2011) on alcohol-use disorders: diagnosis, assessment and management of harmful drinking and alcohol dependence) • reversible causes of anaemia. With patient permission, Secondary Care advice with a Specialist Pharmacist may be sought via email if there are additional queries or concerns that the pharmacist or GP is unable to resolve. If no local specialists are available advice may be requested from joanne.bateman@nhs.net, Project Lead and Lead Pharmacist, Cardiac Network, Northwest Strategic Clinical Network. Queries will be escalated for consultant advice if required. Particularly complicated patients can be referred to the AF Specialist Clinic at Liverpool Heart and Chest Hospital (LHCH) or the Clinical Haematology Service, Roald Dahl Haemostasis and Thrombosis Centre, Liverpool University Hospitals NHSFT for advice about anticoagulation. **Consider:**	**Pharmacist**

A high bleeding risk score should generally not result in withholding OAC. Rather, bleeding risk factors should be identified, and treatable factors corrected. If patients are on concomitant anti-platelets, review if these are appropriate. Consider stopping if >1-year post-acute coronary syndrome (ACS) or stable coronary artery disease. Discuss with GP/Specialist if necessary. Consider gastro-protection if patient is receiving concomitant anti-platelets.	
8. Calculate the Creatinine Clearance (CrCl) • All DOACs may require a dose adjustment based on renal impairment • **Creatinine clearance must be used for calculating renal function** using the Cockcroft and Gault equation (see below). eGFR is **not** a suitable alternative: CrCl (ml/min)= (140 – age) x wt (kg) x 1.04 (female) or 1.23 (male) / serum creatinine (micromol/l) • The actual body weight must be used to calculate CrCl **NB The EMIS clinical system used in primary care has an inbuilt Cockcroft-Gault based renal function calculator which can be used to dose DOACs. EMIS recognises if the patient is prescribed a DOAC and will use actual body weight to calculate CrCl for these patients. The exception are patients taking Dabigatran who are also obese, in this case the calculator uses ideal body weight. In these cases, you should record the creatinine clearance for actual body weight in the consultation. Actual body weight was used in AF trials for all DOACs.** • Another option is to use the MD+ CALC Creatinine Clearance calculator (it can be downloaded as an app to an apple or android device). Always use the most up to date values and check the default units are correct when entering weight and serum creatinine. It would be good practice for the clinician reviewing the patient to document what method was used • Document the method used to calculate CrCl on the template **NB:** • **Pts with CrCl < 15mls/min – refer to GP/Specialist for review as contraindicated (if CrCl borderline 15 – 20mls/min this should be discussed with GP to ensure a DOAC is still appropriate)** • **Pts on Dabigatran and CrCl<30mls/min – contraindicated and refer to GP/Specialist for alternative DOAC**	**Pharmacist**
9. Confirm if the current DOAC dose and indication is correct and the current DOAC dose is appropriate for patients with AF, according to current parameters – see table 6 in Appendix 3 and SPC of each DOAC.	**Pharmacist**
10. Check all medication for any significant drug interactions including hospital prescribed medication, OTC and herbal/alternative therapy– see table 7 in Appendix 4 and SPCs for full details. **NB: If prescribed anti-platelets, consider whether these need to be continued and if unsure, discuss with Specialist, as per point 7.**	**Pharmacist**

11. Discuss any patients on incorrect dose/significant interactions/safety concerns with GP. NB: Where the efficacy of either the DOAC or another medication is affected please ensure this is discussed with the GP and/or relevant specialist e.g. antiepileptics	**Pharmacist**
12. Following agreement by the GP practice, patients on a DOAC should be reviewed as per the regional Decision Aid for Medicines Optimisation Review of DOACs. Generic apixaban is the best value DOAC. C+M ICB recommend that routine DOAC MO reviews should continue to be undertaken.	**Pharmacist**
13. Discuss any other identified issues or queries with the GP as appropriate and document the outcome.	**Pharmacist**
14. Contact the patient to review adherence, side effects, adverse drug reactions (ADRs) or any issues raised during the review. Discuss and agree with patient any recommended changes	**Pharmacist**
Patient review and informed discussion via phone or virtual consultation	
15. Contact the patient/carer as agreed by the practice (telephone or virtual) and go through the patient section of the EMIS DOAC template, checking for any; • GI symptoms (consider addition of PPI or discuss with GP) • Swallowing difficulties • Bleeding • OTC or herbal medications • Adherence • Adverse drug reactions • Side-effects • Excessive alcohol intake • Re-calculate HASBLED/ORBIT score if necessary • Check if patient uses a monitored dosage system and inform community pharmacy of any changes. Use the checklist to ensure you cover all the relevant counselling	**Pharmacist**
16. Advise patients of the issues identified e.g. DOAC agent to be changed or dose change and make the appropriate changes or if there are any interactions that patients need to be aware of	**Pharmacist**
17. For any concerns or further issues identified – discuss with the GP or specialist and document the outcome. Advise patient that you will inform them of outcome of discussion with GP or specialist.	**Pharmacist**
18. Use a suitable code such as '*Medication Review done by Medicines Management Pharmacist*'* and set an appropriate follow up review date that considers the criteria in Appendix 1. Table 1. ***NB: local agreement may differ where and how to record on PMR**	**Pharmacist**

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Agreement to Protocol

Signature of practice prescribing lead/ manager	
Practice name	
Date	

Appendix 1

Table 1: Blood monitoring required for DOACs (Steffel et al., 2021)

Monitoring	
Interval	**Patient Cohort**
Yearly	Patients other than those specified below
4 – monthly	≥75 years (especially if on dabigatran) or frail
Variable X - monthly	If renal function CrCl ≤60 mL/min: recheck interval = CrCl/10 (= X months)
If needed	Any intercurrent condition that may impact renal or hepatic function as identified by the GP/NMP

Appendix 2

Table 2: CHA_2DS_2-VASc risk factor	
Congestive heart failure Signs/symptoms of HF or objective evidence of reduced left ventricular EF	+1
Hypertension Resting BP>140/90 mmHg on at least two occasions or current antihypertensive treatment	+1
Age ≥75 years	+2
Diabetes mellitus Fasting glucose >125mg/dL (7mmol/L) or treatment with oral hypoglycaemic agent and/or insulin	+1
Previous stroke, transient ischaemic attack, or thromboembolism (arterial)	+2
Vascular disease Previous myocardial infarction, peripheral artery disease, or aortic plaque	+1
Age 65-74 years	+1
Sex (female=1)	+1
Score (range 0-9)	

Table 3: HAS-BLED – Assessment of bleeding risk in patients with AF	
Hypertension (Systolic >160mmHg)	1
Abnormal renal function - Dialysis, transplant, serum Cr >200 micromol/L	1
Abnormal liver function – cirrhosis, bilirubin> x 2 upper limit, AST/ALT/ALP X 3 upper limit	1
Stroke – previous ischaemic or haemorrhagic stroke	1
Bleeding tendency or predisposition – previous major haemorrhage or anaemia or severe thrombocytopenia	1
Labile INRs (if on warfarin/VKA) – TTR <60%	1
Elderly (e.g. age > 65 years or extreme frailty)	1
Drugs (e.g., concomitant aspirin, NSAID)	1
Alcohol intake at same time (>14 units per week)	1
Score range (0-9)	
A HAS-BLED score ≥3 suggests that caution is warranted when prescribing oral anticoagulation that regular review is recommended and that the reversible bleeding risk factors are addressed.	

Table 4 – ORBIT	
Selection Criteria	**Points**
Older age ≥75 years old	1
Reduced Haemoglobin /reduced Haematocrit/Anaemia Hb <130g/L Male; Hb <120g/L Hct: <40% Males, <30% Females History of anaemia	2
Bleeding history	2
Insufficient renal function eGFR<60mg/dL	1
Treatment with antiplatelet agents	1
Score (maximum score = 7 points)	

Table 5 – Risk categories and bleeding events in Validation Cohorts						
	Risk Categories			**Bleeding Events in Validation Cohorts (Per 100 patient-years)**		
	Low	**Intermediate**	**High**	**Low**	**Intermediate**	**High**
HAS-BLED	**0-1**	**2**	**≥3**	**1.02-1.13**	**1.88**	**≥3.74**
ORBIT	**0-2**	**3**	**≥4**	**2.4**	**4.7**	**8.1**

Appendix 3

	Apixaban	**Edoxaban**	**Rivaroxaban**	**Dabigatran**
Standard dose	**5mg twice daily**	**60mg daily**	**20mg daily**	**150mg twice daily**
Reduce dose in the following patients	**2.5mg twice daily** If CrCl 15-29ml/min **OR** 2 of the following criteria: - ≥80yrs - Creatinine ≥133 - Weight ≤60kg	**30mg daily** - CrCl ≤50ml/min - Weight ≤60kg - On interacting medication (Ciclosporin, dronedarone, erythromycin, ketoconazole)	**15mg daily** If CrCl <50ml/min	**110mg twice daily** - ≥ 80 years - On concomitant verapamil Consider reduced dose based on individual assessment of the thromboembolic risk and risk of bleeding if: - 75-80yrs and high bleeding risk - Calc CrCl 30-50mls/min - Gastritis, oesophagitis or GI reflux - At increased risk of bleeding Close clinical surveillance is needed if patient weighs <50kg

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Appendix 4

Table 7: Interactions with DOACs – see SPC for full details at emc.medicines.org.uk

Dabigatran	Rivaroxaban	Apixaban	Edoxaban
Ketoconazole, ciclosporin, itraconazole, tacrolimus, dronedarone, ritinovir and combinations -**CONTRAINDICATED**	Azole antimycotics (e.g.ketoconazole, voriconazole, itraconazole) **– NOT RECOMMENDED**	Azole antimycotics (e.g.ketoconazole, voriconazole, itraconazole) **–NOT RECOMMENDED**	Erythromycin, oral ketoconazole, ciclosporin and dronedarone – **reduce to 30mg**
Amiodarone and quinidine increase dabigatran levels – clinical surveillance. Patient with mild-mod renal impairment are at higher risk of bleeding	Rifampicin, phenytoin, carbamazepine, phenobarbital or St.Johns Wort – significant reduction in efficacy of rivaroxaban – **best AVOIDED.**	Rifampicin, phenytoin, carbamazepine, phenobarbital or St.Johns Wort – 50% reduction in serum apixaban level- **CAUTION, seek specialist advice and discuss risk**	Quinidine, verapamil + amiodarone can increase edoxaban – **no dose change**
Verapamil – increases dabigatran levels. **Reduce dose to 110mg BD** and monitor. Take dabigatran and verapamil at the same time.	HIV protease inhibitors e.g. ritonavir – **NOT RECOMMENDED**	Aspirin, clopidogrel, antiplatelets and NSAIDS – increased bleeding risk	Aspirin and antiplatelets – increased bleeding risk Chronic NSAID use –**NOT RECOMMENDED**
Ticagrelor, clopidogrel, prasugrel, aspirin etc. consider dose reduction	NSAIDS/antiplatelets: Ticagrelor, clopidogrel, prasugrel, aspirin etc. increased bleeding risk.	HIV protease inhibitors e.g. ritonavir – **NOT RECOMMENDED**	Rifampicin, phenytoin, carbamazepine, phenobarbital or St. John's Wort – reduces edoxaban levels, reducing effect - **CAUTION, seek specialist advice and discuss risk**
Rifampicin, carbamazepine, phenytoin, St. John's Wort – **NOT RECOMMENDED**	Dronedarone – inadequate data. **AVOID**	Diltiazem, amiodarone, verapamil and quinidine increase apixaban level **- no dose adjustment necessary.**	HIV protease inhibitors – studies not done
Posaconazole – no experience - CAUTION	MHRA warning for potential interaction with erythromycin resulting in increased risk of bleeding when combined		

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Appendix 5 - Medicine Optimisation Reviews for DOACs in AF – Patient/Carer Contacted - Consultation Checklist

DOACs - Apixaban (Eliquis®), Dabigatran (Pradaxa®), Edoxaban (Lixiana®), Rivaroxaban (Xarelto®)

Counselling point **before** starting review
Explain that all patients with non- valvular Atrial Fibrillation who are prescribed a DOAC for stroke prevention are being reviewed to ensure it is appropriate and the correct dose. No need for alarm or concern.

Follow the **EMIS Template** and cover these key questions and counselling points with the patient and/or carer **BEFORE** considering changes to DOAC treatment

Question\Counselling Point	
Check adherence with DOAC treatment.	This includes taking Rivaroxaban 15mg or 20mg with food. Ensure the patient is aware of the importance of adherence with these medications.
Check if the patient has experienced any ADRs or side effects.	Report via yellow card scheme where necessary and update the clinical record. Seek advice from GP or specialist if needed.
"Do you suffer with any symptoms such as: acid reflux, heartburn, stomach pains etc.?"	Is the patient taking gastro protection medication regularly? Refer to the GP for gastro protection if not already prescribed or if already prescribed gastro protection and still symptomatic
"Any current symptoms of bleeding?"	Ensure patient knows the signs to be aware of and to contact their GP or, if severe, to go straight to hospital or call an ambulance. Bruising or bleeding under the skin • Blood in the urine • Coughing up blood • Vomiting blood or material that looks like ground coffee • Nose bleeds or cuts that take a long time to stop bleeding • Tar-coloured stools • Dizziness or sudden headache • Unexplained tiredness • Abnormal vaginal bleeding, including heavier or prolonged menses •new confusion
"Any swallowing problems with tablets?"	Apixaban, rivaroxaban and edoxaban tablets can be crushed and mixed with water, apple juice or apple puree. Patients with long term swallowing problems should remain on apixaban, edoxaban or rivaroxaban. Dabigatran **must not** be crushed so is not suitable for patients with swallowing problems.
"Are you taking any other medication (e.g. from the hospital), OTC or herbal medicines?"	For example, Aspirin, NSAIDS, St. John's Wort etc. ensure the patient is aware to always check with a pharmacist before using any OTC or herbal meds due to risk of interactions with anticoagulants.
Check on alcohol consumption - Re-calculate HAS-BLED/ORBIT score as needed.	If appropriate, remind patient of current government guidelines; no more than 14 units of alcohol per week for men and women spread over at least 3 days with several alcohol-free days per week.
"Have you ever had a blood clot? Or been told you have a blood clotting problem?"	This is to check any history of DVT or PE (including any unusual clots such as LV thrombus or portal vein thrombosis) or any thrombophilia that may not have been recorded on the PMR. This would highlight if the patient is on a DOAC for an off license use (LV thrombus) or requires a different dose e.g. DVT/PE

	Note: only arterial clots are considered as a thromboembolism when calculating CHA_2DS_2-VASc (excludes DVT/PE), but this may highlight different dose requirement
"Have you ever had an operation on your heart?"	This is to check if the patient may have had a mechanical heart valve replacement or valve repair that has not been recorded on the PMR which may contraindicate treatment of any DOAC.
IF APPROPRIATE: Check if the patient is pregnant or breastfeeding	DOACs are normally contraindicated during pregnancy and women of child-bearing potential should avoid becoming pregnant during treatment. Advise to use reliable contraception and discuss with the GP if planning pregnancy. DOACs also normally contraindicated during breastfeeding, it should be decided whether to cease therapy or to discontinue breastfeeding. Seek specialist advice from haematology if pregnant or breastfeeding.
Explain decision to change patient to another DOAC or change the dose of existing therapy if relevant	Advise patient of necessary changes and why. If DOAC agent changing to alternative, explain the rationale There is a PIL available to support this discussion (Appendix 9).
If further advice is needed from a specialist outside of the GP practice gain patient consent to discuss	Patients already discussed with the GP but who need further information, advice may be sought from a secondary care specialist pharmacist who may discuss with a Cardiologist if necessary. This will require documented patient consent. Complicated patients can be referred to the Specialist AF Clinic at LHCH.

Counselling points	After decision of DOAC change
If DOAC treatment to be changed	If a DOAC is going to be changed to an alternative DOAC, assure the patient that the new DOAC will have the same beneficial effect as their current anticoagulant and their risk of stroke due to AF will be controlled in the same way as before. A patient information leaflet has been developed to guide this discussion (Appendix 9). Explain that their full history and medication has been reviewed and the new DOAC is appropriate and most cost-effective.
Changing from one DOAC to another	When changing from one DOAC to another advise the patient to use up the remainder of their existing DOAC first. It is important that the new DOAC is started when the NEXT dose was due of the ORIGINAL DOAC. The dose should then be continued as labelled (see below for how change in DOAC directions should be explained to each patient with written instructions). **Once daily DOAC to twice daily DOAC:** Finish the last dose of the existing once daily DOAC and start the new DOAC 24 hours later then continue taking the new DOAC every 12 hours twice a day **Twice daily DOAC changing to a once daily DOAC:** Finish the last dose of the existing twice daily DOAC and start the new DOAC 12 hours later (when the existing DOAC would have been due). Then continue on the new DOAC every 24 hours, once a day.
Dosage and Directions	Clearly explain the dosage and directions of the DOAC. Apixaban, edoxaban and dabigatran can be taken **with or without food**, should be swallowed whole and not chewed (do not open dabigatran capsules). Rivaroxaban should be taken with food.

	Edoxaban and rivaroxaban have **ONCE daily administration** and apixaban and dabigatran are taken **TWICE daily**. Explain importance of good adherence to medication.
Missed Dose	Explain the the importance of good adherence. Explain that to ensure optimal protection from blood clots, never skip a dose and NOT to stop taking unless advised by a doctor. If a dose of apixaban is missed, the patient should take apixaban immediately and then continue with twice daily intake as before. If the patient misses a dose of edoxaban or rivaroxaban they should take it immediately and then continue the following day with the once-daily intake as recommended. The patient should **not** take double the prescribed dose on the same day to make up for a missed dose. A missed dose of dabigatran may still be taken up to 6 hours prior to the next scheduled dose. From 6 hours prior to the next scheduled dose on, the missed dose should be omitted.
General additional advice for DOACs	It is important that patients inform other health professionals treating them, including their dentist and pharmacist that they are taking this medicine. Inform a healthcare specialist if they need to have surgery or an invasive procedure. Patients should seek urgent medical attention if they fall or injure themselves during treatment, especially if they hit their head, due to the increased risk of bleeding. Lifestyle advice regarding contact sports or extreme sports should be included in the counseling where appropriate as an injury whilst taking a DOAC could cause serious bruising or bleeding.
Reversal Agents	There are reversal agents available which can be used in severe bleeding or if emergency surgery/procedure is required in an emergency under specific circumstances. See the SOP for further details.
Alert Card	Advise the patient/carer to always carry their alert card (supplied with medication) and always inform health professionals that they are taking an anticoagulant prior to any procedure.
Weight change	Advise that the patient should inform their GP about any significant weight change that results in their body weight going **above 60kg (9st 6.3lb) or below 61kg (9st 8.5lb)** as their dose may need to be changed.
Monitored Dosage System?	Check if patient uses a monitored dosage system and inform the community pharmacy if any change to treatment is required.

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Appendix 6 – Decision Aids for New Initiation of DOAC in Patients with AF/flutter
NHS England — North West » CVD and Stroke protocols and click on document number 34

Appendix 7 - Guide to Installing the DOAC Search with Reports

The searches may require local adaptation, depending on how the reviews are being implemented and how the codes included in them are used in each area.

Copy and paste the embedded zip file to an appropriate location such as the desktop.

DOAC EMIS Resources.zip

Unzip the folder by right clicking on the zip file and select “Extract all”. You will be asked to select a location to store the unzipped folder e.g., the desktop.

Click “Extract” and the unzipped folder will open showing 2 files: The C+M DOAC search with report (to identify patients for review) and a folder of searches to support capturing the total number of DOAC reviews and optimisations to apixaban completed.

Installing the DOAC search with reports.

Go to the EMIS globe and select Reporting>Population Reporting and select the folder where you want to import the search and reports, for example “Medicines Management”

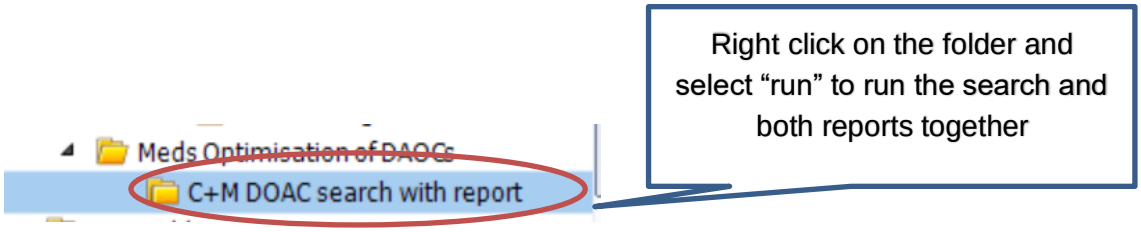
On the population reporting toolbar select “import”. You will need to locate the Meds optimisation of DOACs folder (or create this if not previously done) and then select the XML document called “C+M DOAC search with report”. Click Open and then click OK.

The search and reports should be installed within a folder called “C+M DOAC search with report”.

Opening that folder should reveal the search and two reports as seen here.

Name	Population Count	%	Last Run	Search Type	Scheduled	Code System
Patients on a DOAC with NVAF				Patient		SNOMED CT
Blood Results				Patient		SNOMED CT
Review				Patient		SNOMED CT

To run the search and two reports simultaneously, right click on the “C+M DOAC search with report” folder and select “Run”. You can then view the results of the two reports.



To help target reviews, Ardens offers a set of targeted searches for DOAC medication reviews. These searches help identify patients who may be on the incorrect dose and could benefit from a review of their DOAC dosage. These can be found in Population Reporting > Ardens > Prescribing Alerts > Anticoagulants.

Appendix 8 – Installing the DOAC Review Template

This EMIS template has been developed to specifically undertake a medicines optimisation DOAC review for patients with atrial fibrillation/flutter across Cheshire and Mersey. There are other templates available that some GP practices might prefer to use to review DOACs that are available nationally including the Ardens AF Advisor and the Ardens Anticoagulant template. These may be an alternative, particularly for those practices who do not have EMIS available.

Unzip the folder by right clicking on the zip file and select “Extract all”. You will be asked to select a location to store the unzipped folder e.g., the desktop. Click “Extract” and the unzipped folder will open showing 1 file, the DOAC Review Template v2.

Installing the template for the first time

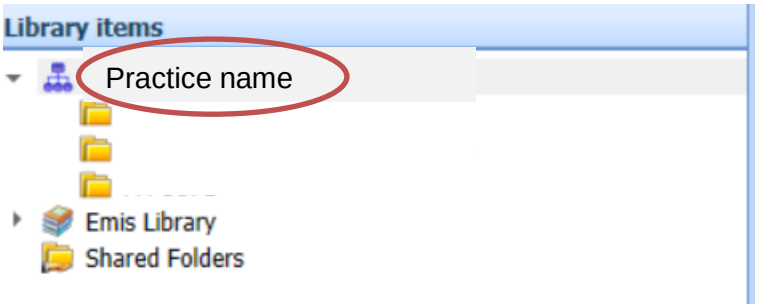
To import the Template into EMIS you will need to access resource publisher.

Go to the EMIS Globe > Configuration > Resource publisher.

The template requires a library item and concepts to be installed. It is recommended you first create a new folder for the library item and concepts so that you can easily find it in the future if needed.

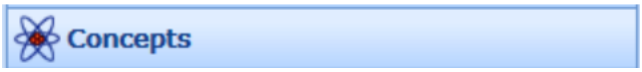
Select Library items from the menu on the left of the screen.

Click on the practice name. **Be careful NOT to select one of the subfolders**.



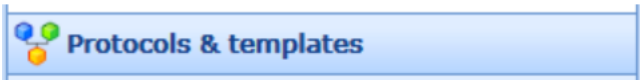
Click Add > folder at the top left. Name the folder in an appropriate way for example “DOAC meds optimisation” and save it.

Now Select Concepts



Click on the practice name as before. Click Add > folder at the top left. Name the folder in an appropriate way for example “DOAC meds optimisation” and save it.

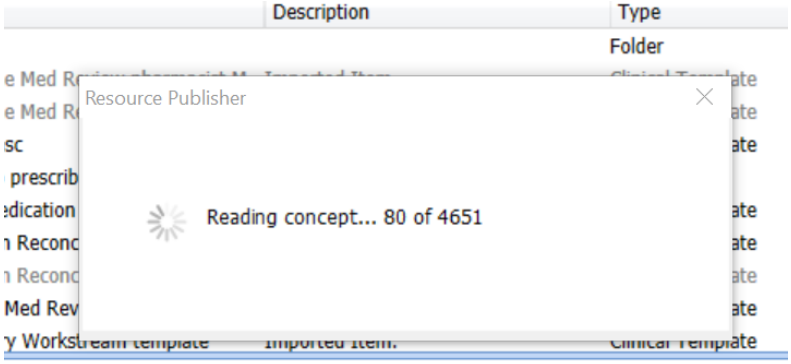
Now select Protocols and Templates from the left menu.



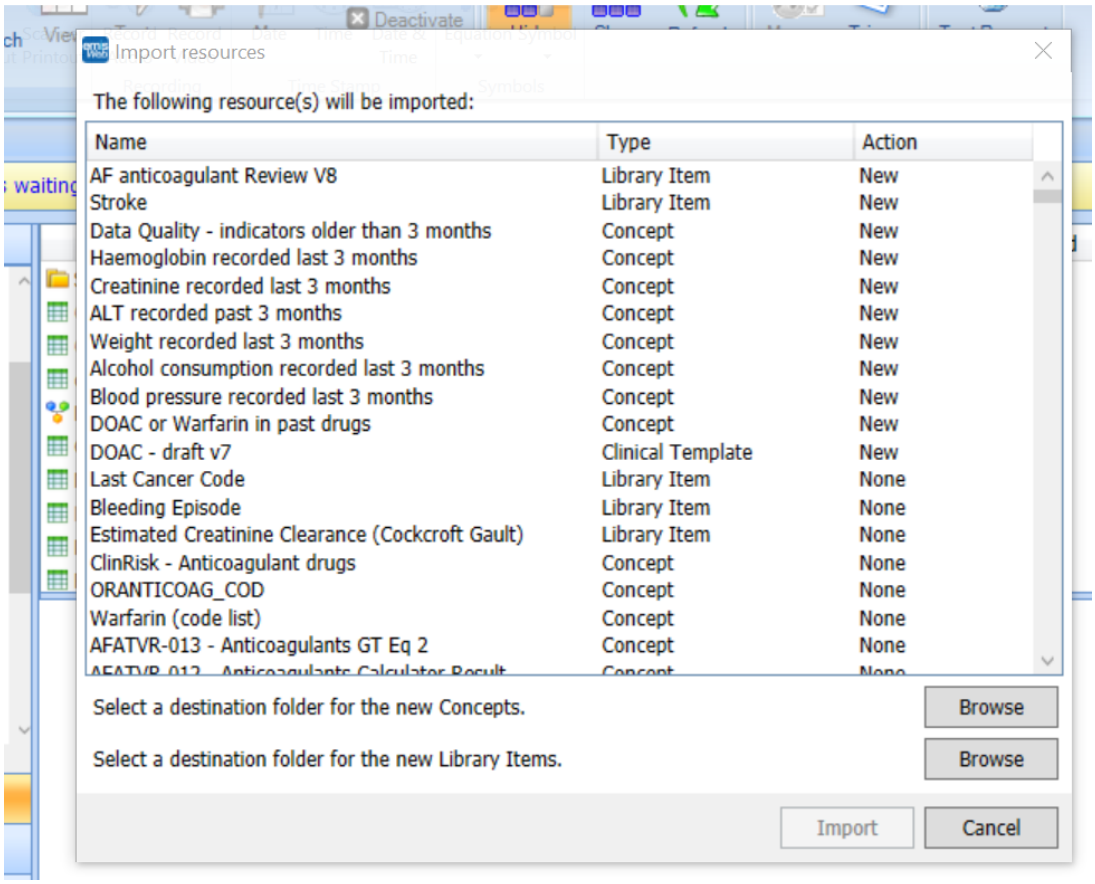
Select the folder where you want to install the template, for example “Medicines Management”.

Click “import” and find the xml document called “DOAC Review template” and select open. You will see a dialogue box as shown here.

It may take a few minutes for EMIS to prepare the concepts and library items.

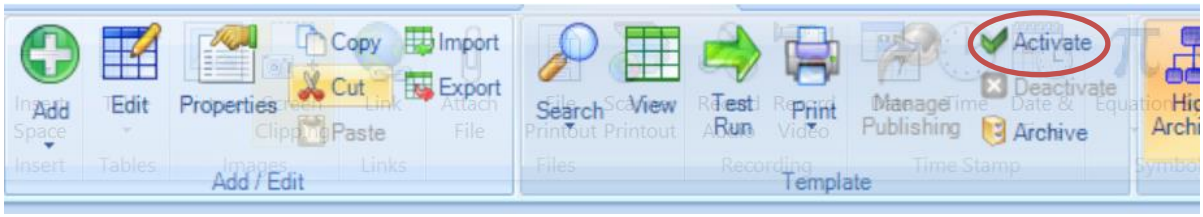


You will then see a dialogue box asking for you to select a destination folder for the concepts and library items.



Find and select the two folders you have just created and then select import.

You may find that the template is imported as a draft. Select Activate from the toolbar at the top of the screen.



You may then be asked if you want to activate all linked draft resources. Select “activate all”.

You should now be able to run the template in a patient consultation. It is suggested you try this on a dummy patient first to ensure the template is working.

If you require any further support with the EMIS search or template, contact Helen Roberts – Helen.Roberts@southseftonccg.nhs.uk

Installing an updated version of the template

1. Create a new folder in Concept Manager, name it Medicines optimisation of DOACs v2.
2. Archive previous folder.
3. Repeat the same in Library items.
4. Archive previous version of the template.
5. Import the v2 version of the template,
    - select Medicines optimisation of DOACs v2 folder for importing concepts.
    - Select Medicines optimisation of DOACs v2 folder for Library item.
6. Complete.
7. You may find that the template is imported as a draft. Select Activate from the toolbar at the top of the screen.
8. You may find you need to log out or refresh EMIS before the updated template appears.

Appendix 9 - Patient information leaflet: Guide for patients to understand changes in anticoagulation (DOACs) available as document 35:
NHS England — North West » CVD and Stroke protocols

Reference list

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