NHS
Greater Glasgow and Clyde

# CLINICAL GUIDELINE

# Fracture Surgery, Management of DOAC, Warfarin or Anti-Platelet Medication

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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| **Approval Group:** | Cross Sector Orthopaedic Clinical Governance Forum |

**Important Note**:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

## BACKGROUND

The Warfarin Management Protocol is ude for review in August 2018. This protocol has successfully reduced variation in the management of hip fractures in patients anticoagulated with warfarin. There have been a few minor changes to this protocol (highlighted in yellow) based on feedback.

An increasing number of patients are being prescribed DOACs such as Apixaban, Edoxaban, Rivaroxaban, and Dabigatran for the long-term prophylaxis of thromboembolism. Whereas warfarin can be reversed with Vitamin K and other agents/factors, DOACs present challenges in the peri-operative period. While a reversal agent does exist for Dabigatran (Idarucizumab – Praxbind®), agents for the other DOACs remain in development. It was clear that there was a need for an extension of this protocol to cover these new direct oral anticoagulants, along with antiplatelet medication.

For elective surgery, NHS GGC guidelines exist to advise timely withholding of medication to reduce the risk of bleeding. These guidelines balance the risk of bleeding from the procedure, along with the risk of thromboembolism from the underlying condition. Separate consideration is given to the provision of neuraxial anaesthesia while taking DOACs.

Patients with hip fractures are increasingly presenting on DOACs. Evidence supports early fixation or arthroplasty, to reduce the risk of complications and facilitate early mobilisation. Because of this the balance of risks supports early surgery in selected patients despite the presence of DOAC medication. Until now, hip fractures have been classified as having a high risk of peri-operative blood loss, and combined with the risk of DOAC treatment, this has resulted in delays of greater than 48 hours.

To achieve early surgical management of these patients, pathways have been implemented elsewhere in Scotland to allow surgery to progress sooner in patients on DOAC therapy. This recognizes that pragmatically, the risk of bleeding is outweighed by the risk of delaying surgery. This also requires a shift to general anaesthesia in these patients as spinal anaesthesia remains contra-indicated in patients still under the influence of DOACs. This will exclude some patients who will be optimally managed with spinal anaesthesia. There is currently equipoise in the literature regarding whether regional or general anaesthesia is preferable in this patient group. A Cochrane Review (2016) demonstrated no significant clinical difference in outcome. However, this must be interpreted with a degree of caution due to the heterogeneity of studies and difficulty performing RCTs in this patient group. Given this current evidence it is reasonable that surgery should be offered a soon as possible and balanced mainly against bleeding risk, rather than delaying a patient purely to provide a spinal anaesthetic. However, there are patients for whom regional anaesthesia is the most sensible choice and this decision will be made by the responsible Consultant Anaesthetist.

This guideline introduces a pathway for use in hip fracture patients throughout GGC. There has been extensive consultation with the GGC Thrombosis Committee and surgical and anaesthetic staff throughout GGC.The aim is to reduce delays in surgical treatment of hip fractures in patients taking DOACs to improve outcomes. It reflects current practice of the peri-operative management of patients taking Warfarin.

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Rachel Kearns, Consultant Anaesthetist, GRI

**REFERENCES**

- GGC Clinical Guideline: Apixaban, Edoxaban and Rivaroxaban: Management of Haemorrhage, Surgery and other Invasive Procedures (1/10/2017)
- BSH Guidelines: Perioperative management of anticoagulation and antiplatelet therapy
- Guidelines for Management of Anticoagulants in Patients with Hip Fracture – NHS Borders (Version 3)

# Protocol for **Warfarin reversal** in patients admitted with hip fracture

R Kearns on behalf of GRI Thrombosis Committee, Aug 2018. Review Aug 2020

## START HERE

Patient presents requiring trauma surgery. Patient is taking regular warfarin

### STEP 1:

Send FBC, INR, U+E, LFT, G+S.

**If INR > 4.5, consider use of Beriplex as per protocol in NHSGGC Therapeutics Handbook**

### STEP 2:

Is the patient going to require emergency surgery? (uncontrolled bleeding) compartment syndrome)

**YES**

- Establish IV access.
- Cross Match.
- Give 5mg IV Vit K (in 100ml 5% dextrose over 30 mins).
- Consider Beriplex if not already given.

Reassess and repeat INR.

**NO**

Is surgery required within 24 hours? (e.g. hip fracture)

**NO**

Management will depend on individual circumstances. Discuss with orthopaedic surgeon plus haematologist if required.

**YES**

**INR ≥ 1.5**

**YES**

### STEP 3:

**STOP Warfarin. Give 5mg IV Vit K** (in 100ml 5% dextrose over 30 mins).
If INR > 4.5, consider use of Beriplex as per protocol in NHSGGC Therapeutics Handbook.
Repeat INR 12 hours after vitamin K dose.

**RISK ASSESSMENT ***

## PRE-OP

**High thrombotic risk**

**Start enoxaparin 40mg sc at 1800 on day 1 after admission.**

- *Check INR daily at 06:00, may require further IV Vit K in doses of 2mg.*
- If surgery is delayed > 24h due to inadequate warfarin reversal, discuss with Haematology re possibility of Beriplex

**Low thrombotic risk**

**THEATRE WHEN INR ≤ 1.4**

## POST-OP

Give 40mg enoxaparin sc at 1800, or 6 hours post-op (whichever is later). **NOT IF BLEEDING.**

**24 hrs post-op**

**Low thrombotic risk**

Re-start warfarin at usual dose 24 hours post-op. **NOT IF BLEEDING.**

**High thrombotic risk**

**Low risk of bleeding and no epidural;** increase enoxaparin to 1mg/kg od.

**Continued high-risk of bleeding;** continue 40mg enoxaparin. Once bleeding risk considered low, increase to 1mg/kg + restart warfarin. If epidural in situ, discuss with on-call anaesthetist.

**Continue enoxaparin until INR therapeutic.**

## IMPORTANT CONSIDERATIONS

- *Dose of enoxaparin should always be rounded down rather than up and should not exceed 120mg.*
- *Consider enoxaparin dose reduction if eGFR <30ml/min/1.73m2 or weight < 50kg - see NHSGGC Therapeutics Handbook or discuss with pharmacist*
- *If patient has an epidural in situ, discuss with on-call anaesthetist for appropriate management of anti-coagulation.*
- *Heparin (including enoxaparin) is contraindicated in patients with a history of Heparin Induced Thrombocytopaenia (HIT).*

## * Is Patient at High or Low risk of Thrombosis?

### HIGH RISK

- **Metal mitral valve, any 'ball and cage' valve, pre-1990 metal aortic valve or embolism / thrombosis within 4 weeks - VERY HIGH RISK - DISCUSS WITH HAEMATOLOGY.**
- AF with previous stroke, embolism, valve disease or valve replacement.
- Artificial valve plus previous embolism.
- Any valve replaced within previous 2 months.
- Arterial embolism or venous thrombosis within previous 3 months.
- Prior recurrent venous thrombosis.
- Prior venous thrombosis and known high risk thrombophilia (e.g. anti-thrombin deficiency, Protein C or S deficiency, antiphospholipid syndrome).
- Patient with target INR of 3-4.

### LOW RISK

- AF with normal heart valves and no previous embolism or stroke.
- Single episode of venous thromboembolism > 3 months ago.
- Sinus rhythm, with tissue or modern (post 1990) metal aortic valve inserted > 2 months ago.

# Protocol for MANAGEMENT OF DIRECT ORAL ANTICOAGULANT MEDICATION (DOAC) in Patients with Hip Fracture

**Preoperatively:**

***PATIENTS WITH HIGH THROMBOSIS RISK (metal mitral valve, 'ball and cage' valve, pre 1990 metal aortic valve, mechanical valve-associated embolus within last 4 weeks prior, AF with stroke/embolism/valve disease/valve replacement, valve replacement within last 2 months, arterial embolism/VTE within last 3 months, prior recurrent venous thrombosis, venous thrombosis with known high risk thrombophilia) SHOULD BE DISCUSSED WITH ANAESTHETICS & HAEMATOLOGY ON A CASE BY CASE BASIS***

- DOAC should be stopped on admission – there is no need for pre-operative bridging. The date and time of the last DOAC dose should be documented.
- Ascertain timing of last dose of DOAC and estimate bleeding risk. Record this clearly in notes and medicine reconciliation. Use the table below to plan timing for surgery. Estimate time of surgery from last dose of anticoagulant, not time of admission to hospital

-The following times should be observed between last DOAC dose and surgery:

| | **Normal Renal Function** | ***Creatinine Clearance <30** | ****High Bleeding Risk** |
|---|---|---|---|
| **Apixaban** | 24h | 48h | Add 24h |
| **Rivaroxaban** | 24h | 48h | Add 24h |
| **Edoxaban** | 24h | 48h | Add 24h |
| **Dabigatran** | Cr Cl>80: 24h | Cr Cl 50-80: 24-48h delay<br>Cr Cl 30-50: 48-72h delay<br>Or consider use of idarucizumab (Praxbind®) (1-2hrs before surgery)** | Add 24h |

These times are from last dose of DOAC (not time of admission)

***** Assessment of renal function should be done by calculating creatinine clearance using the Cockroft and Gault formula, ***not*** eGFR. A GGC creatinine clearance calculator can be accessed on Staffnet Clinical Info page or directly here.

******Coagulation screen (including Thrombin Time) **must** be checked pre-op, and if Thrombin Time has not normalized then consider bolus administration of idarucizumab (Praxbind®) pre-op.

Surgeon and Anaesthetic discretion should be used in evaluating the following patients who may, after discussion, be treated as having a higher bleeding risk, or risk of greater complication from blood loss:

- More extensive/complex surgery
- Periprosthetic fracture
- IM Nailing for pathological fracture
- Concomitant use of anti-platelet agents
- Jehovah's Witness
- Aortic Stenosis
- Heart failure

**Intraoperative management:**

-There may be a **residual anticoagulant effect** and haemostasis should be carefully secured.

**-Tranexamic acid** should be administered peri-operatively (consider combined IV and topical use where appropriate)

**Regional (Spinal) Anaesthesia:**

For spinal anaesthesia, the minimum time post last dose is 48 hours (or 72 hours if CrCl<30). Therefore, general anaesthesia will be required if surgery is performed in the period 24-48 hours. If general anaesthesia is contra-indicated for reasons of active comorbidity, surgery should be deferred until spinal anaesthesia can be administered.

**Peripheral nerve block:**

Fascia iliaca blocks may be considered by a senior Anaesthetist experienced in this technique, under ultrasound guidance if deemed appropriate after consideration of risks versus benefits"

**Reversal**: If the patient is on dabigatran and surgery is required <24 hours after the last dose, a reversal agent is available: idarucizumab (Praxbind®). This can be obtained via pharmacy. Its use should be discussed with the Haematologist on-call

**Haemorrhage**: There should be a discussion with Haematology about the possible use of Beriplex (See GGC Policy)

**Post-operative Management**:

Re-introduce thromboprophylaxis as per the the GGC guidelines on the management of patients on DOACs following elective surgery.

Restart DOAC at least 48 hours post procedure (and at least 24 hours after the last dose of LMWH – DO NOT PRESCRIBE CONCURRENTLY)

# Protocol for Management of ANTI-PLATELET AGENTS in Patients with Hip Fracture

*If a patient is on an anti-platelet medication in addition to warfarin or a DOAC, please seek haematology advice

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| **ASPIRIN ALONE** | **CONTINUE DRUG AND <u>DO NOT DELAY SURGERY</u>** |
| **CLOPIDOGREL ALONE** | **Withhold Clopidogrel on proposed day of surgery prior to review by Consultant Anaesthetist as this may influence anaesthetic options. The Consultant Anaesthetist, in discussion with the Consultant Surgeon will advise regarding the suitability of giving clopidogrel on the day of surgery after consideration of the risk profile. If high risk of bleeding, withhold for 24h pre-op.**<br>Evidence suggests a trend towards increased bleeding risk but not to an extent significant enough to warrant delaying surgery. If the patient is **high risk of bleeding** then delaying surgery 24h from last dose allows transfusion of platelets to be more efficacious. |
| **DUAL ANTIPLATELETS** | **STOP CLOPIDOGREL ON ADMISSION, CONTINUE ASPIRIN, DELAY SURGERY BY 24h**<br>Likely to be at high risk of complications (e.g. recent cardiac stent or stroke). Bleeding risk is likely to be high and platelet and blood transfusions may be required. Delay surgery 24h from last dose of clopidogrel to avoid platelet inhibition from residual drug. Delaying longer than 24h is likely to increase thrombosis risk |
| **OTHER ANTIPLATELETS** | **E.g. Ticagrelor, Dipyridamole, Prasugrel**<br>No guidance is available regarding bleeding risk for these drugs. Discuss with anaesthetist in first instance |

## Implementation Plan

This guideline will be distributed via the Orthopaedic & Anaesthetic departments in each Sector. The implementation of the guidance will be measure through regular snapshot audit of “time-to-theatre” for this patient group, along with any haemorrhagic or thrombotic complications.