MIL

Oxford University Hospitals NHS
NHS Foundation Trust

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This Medicines Information Leaflet is produced locally to optimise the use of medicines by encouraging prescribing that is safe, clinically appropriate and cost-effective to the NHS.

Management of oral anticoagulation in adult patients with head injury

This MIL is applicable to all adult patients treated at Oxford University Hospitals NHS Foundation Trust (OUH).

1. General recommendations for all patients taking an oral anticoagulant & suffering a head injury

a. All patients should have a coagulation screen (PT/INR & APTT) and FBC performed immediately. If a patient is taking a DOAC then also consider a specific assay of drug plasma levels (patients on a DOAC may be significantly anticoagulated but have a normal PT and APTT).

b. All adult patients taking an oral anticoagulant should undergo a CT head within 8 hours of admission, unless there is an indication for an urgent CT head. Indications for an urgent CT head (i.e. within 1 hour) are:

- GCS less than 13 on initial assessment in ED
- GCS less than 15 at 2hrs post injury
- Suspected open or depressed skull fracture
- Any sign of basal skull fracture
- More than 1 episode of vomiting
- Post-traumatic seizure
- Focal neurological deficit

c. Management of head injury in anticoagulated patients will depend on the patient's clinical condition. A confirmed intracranial bleed will require immediate therapy and discontinuation of the anticoagulant (see sections 2 and 3).

d. It is more difficult to decide upon management of a patient where an intracranial bleed has been excluded and advice from haematology may be sought (see sections 4 and 5).

e. If it is decided (after weighing thrombotic versus bleeding risks) that anticoagulation is to be withheld following a head injury, the clinical team making this decision **must ensure** that the patient is counselled and that there is a robust documented plan in place for restarting anticoagulation.

f. If the patient is discharged, ensure that there is prolonged support from a close relative/friend for up to 4 days to ensure no neurological deterioration.

g. If a patient requires admission the clinical team should regularly review the need for thromboprophylaxis whilst in hospital.

h. Follow NICE guidelines as to other clinical management of head injury. This can be found here:http://orh.oxnet.nhs.uk/EmergencyDepartment/Pages/Trauma.aspx

2. Management of intracranial haemorrhage (ICH) – reversal of warfarin

If a patient on warfarin is found to have an ICH, the following management should be implemented:

❖ Discontinue warfarin medication.

❖ Reverse anticoagulation immediately and **BEFORE INR RESULTS ARE BACK** with Prothrombin Complex Concentrate (PCC) **AND** Vitamin K (phytomenadione):-

- **Table 1: Dose of PCC for warfarin reversal**

Weight	Dose of PCC
less than 60kg	1500 units
60-75kg	2000 units
76-90kg	2500 units
greater than 90kg	3000 units

- Vitamin K = 5-10mg by slow intravenous bolus

❖ Immediately after PCC has been given, repeat the clotting screen and assess degree of correction of INR. If not corrected discuss with a haematologist, bleep 5529.

PCC is available from Blood Bank and is also accessible from within ED. A haematology registrar does not need to authorise the use of PCC for reversal of warfarin therapy in situations of limb and/or life-threatening bleeding.

The decision regarding **restarting warfarin or other forms of anticoagulation following an ICH can be made whilst the patient is on the ward. This is a balance of risk/benefit and depends on the bleeding risk from head injury as well as the underlying thrombotic risk of the individual.**

Inform the anticoagulant warfarin service of the patient including details of injury, outcome and changes to warfarin management (bleep 1857 or ac.service@nhs.net for out of hours contact).

3. Management of intracranial haemorrhage (ICH) – 'reversal' of direct acting oral anticoagulants (DOACs)

The guidance for treating bleeding in patients taking DOACs (i.e. dabigatran, apixaban, rivaroxaban and edoxaban) is set out in MIL Vol 10, No 6 'Management of bleeding, emergency surgery and overdose in adult inpatients on Direct Oral Anticoagulants (DOACs).'

The main principles include:

1. Discontinue oral anticoagulant medication.
2. Treat active bleeding following standard haemorrhage therapy procedures e.g. blood components as required, consider tranexamic acid and the use of PCC. Please discuss these measures with haematology. The Major Haemorrhage Guidelines can be found here: http://orh.oxnet.nhs.uk/BloodTransfusion/Pages/MajorHaemorrhageProtocol.aspx
3. Dabigatran therapy is reversed using idarucizumab which can be accessed via the emergency drug cupboard fridge.
4. Andexanet, an antidote to rivaroxaban, and apixaban) is **not** approved by NICE for the treatment of ICH and should be used only in a research setting for this indication, at the time of writing.

The decision regarding **restarting warfarin or other forms of anticoagulation following an ICH can be made whilst the patient is on the ward. This is a balance of risk/benefit and depends on the bleeding risk from head injury as well as the underlying thrombotic risk of the individual.**

4. Patients taking warfarin with intracranial haemorrhage (ICH) excluded

a. Patients with head injury who take warfarin are at risk of delayed intracranial bleeding (within the first week of injury) even after an ICH has been excluded at the time of injury. Patients with an INR greater than 4 are at the highest risk of bleeding.

b. The risks of thrombosis versus the possibility of future intracranial bleeding in the week post-injury should be evaluated on an individual basis. The decision to continue or withhold anticoagulation can be difficult.

c. The tables below lists conditions that can help categorise patients into those with higher thrombotic or higher bleeding risks:

Table 2: High thrombotic risk patients

VTE	Patients with a VTE within previous 3 months. Very high risk patients such as patients with a previous VTE whilst on therapeutic anticoagulation Chronic Thromboembolic Pulmonary Hypertension (CTEPH) Triple positive antiphospholipid syndrome (Positive lupus anticoagulant, positive anticardiolipin and β2 GP1 antibodies)
AF	Patients with a previous stroke/TIA in last three months. Patients with a previous stroke/TIA and three or more of the following risk factors: • Heart failure • Hypertension (greater than 140/90 mmHg or on medication) • Age over 75 years • Diabetes mellitus
MHV	All mechanical heart valve patients
Cardiac thrombus	Patients with ventricular thrombus

Table 3: High bleeding risk patients

Concomitant aspirin or other anti-platelet agent
Known inherited or acquired bleeding disorder
INR greater than 4

d. Reversal of warfarin followed by withholding warfarin for up to 1 week may be considered after head injury. If this route is taken, it is the responsibility of the treating physician to ensure that anticoagulation is reinstituted by day 8 (**inform anticoagulation service bleep 1857 or for out of hours via email ac.service@nhs.net**).

e. To fully reverse warfarin administer 5mg vitamin K (phytomenadione) intravenously. Recheck INR 6-8 hours later.

f. If full warfarin reversal is **not** to be undertaken, for example if the risk of thrombosis outweighs the risk of bleeding, make sure that a patient has a therapeutic INR. If the INR is therapeutic, no change to warfarin is required. If INR is supra-therapeutic, administer appropriate oral vitamin K dose (see table below). Oral vitamin K should be administered using the Konakion MM Paediatric 2mg/0.2ml preparation.

Table 4. Dose of vitamin K for partial reverse of warfarin

INR value	Dose of oral vitamin K
4 – 7.9	1mg
8 – 11.9	2mg
Greater than 12	5mg

Please recheck INR 12 hours after oral vitamin K administration and if INR remains supratherapeutic, please discuss with the haemostasis registrar (bleep 5529).

Inform the anticoagulant service of the patient including details of injury, outcome and changes to warfarin management (bleep 1857 or (ac.service@nhs.net for out of hours contact).

5. Patients taking direct acting oral anticoagulants (DOACs) with ICH excluded

There are emerging data on the risk of intracranial bleeding with DOACs after head injury. Reports from small observational studies indicate rates of ICH are lower than for warfarin (Fuller, Soleimani). However, high-quality evidence remains limited and current guidance suggests that a shared decision approach is ideal (Minhas, et al, 2018; Hickey et al, 2021). Extrapolation from the warfarin data might suggest that discontinuation of a DOAC for 1 week may be considered. Risk of thrombosis versus risk of bleeding should be considered individually for each patient. A shared decision made with the patient should be documented in the notes and if a DOAC is withheld, a confirmed date for restarting should be documented.

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