Appendix 6 - Management of patients with out of range INR

Guidelines for managing out-of-range INRs

Patients on anticoagulation therapy with Warfarin require regular INR monitoring to ensure that they are anticoagulated within the therapeutic range recommended for them. The risk of bleeding increases significantly if the INR rises above 4.5 and the risk of thrombotic complications increases if the INR drops below the therapeutic range.

Purpose and Scope

This document describes how to manage patients with out-of-range INR results. This is to ensure that provision of care is safe, evidence based and delivered in a consistent manner. This guideline is intended, for use by Practice Nurses and GPs, providing an Anticoagulation Service in Camden, to help with triage and management of patients with out-of-range INR results

Patient with signs or symptoms of significant bleeding

- Check pulse, blood pressure and INR
- Urgently transfer to local A&E for assessment, administration of vitamin K and/or prothrombin complex concentrate
- Review history for potential cause if INR is high

INR greater than 4.5

If the INR is greater than 4.5 on POCT an initial assessment of the patient should include:

1. Assess patient for signs or symptoms of unexpected/extensive bruising or bleeding.
2. Review history for potential causes for high INR:
    a. change in medication
    b. change in diet
    c. excess alcohol intake in last 3-4 days
    d. administration error (incorrect dose of warfarin, unintentional administration of warfarin twice in one day)

INR is greater than 4.5 but less than 5.0 on POCT:

- Adjust Dose of warfarin as outlined below based on POCT- INR result.
- There is good concordance of POCT-INR results and INR results from venous blood samples below INR of 5.0.
- Advise patient that they are at increased risk of bleeding whilst the INR is high and that they should attend their nearest A&E if they notice new onset bruising or bleeding after their clinic attendance.

INR is greater than 5.0 on POCT:

- Take a venous blood sample to confirm INR result.
- Please indicate on request form that the sample is urgent and from a patient on Warfarin monitored in Primary Care. Provide telephone number for laboratory staff to call with result. – Please note that laboratory staff will only be able to communicate result to Practice Nurse/GP managing anticoagualtion

- Advise patient to not take any more Warfarin until blood result is available
- The Practice Nurse/GP will call the patient later that day with dosing advice.
- The dose of Warfarin will be adjusted as outlined below based on the INR result obtained from the venous blood sample.
- For INR results greater than 8.0, transfer to A&E, for confirmation of result on a venous blood sample and oral administration of vitamin K_1 2mg (Konakion MM Paediatric) will be required.

If there are no obvious signs of bleeding refer to the dosing regime stated below:

INR in patients with target INR 2.5 (2.0-3.0)	INR in patients with target INR 3.0 (2.5-3.5)	Dose change	Next INR
<1.5	<2.0	Single dose of 1.5 – 2 times of current dose then consider to increase weekly dose by 10-20%	7 – 14 days
1.5-2.0	2.0-2.4	First low result no change in dose, check in 1 week If two consecutive INRs are low, increase weekly dose by 10-20%	7 days 7 – 14 days
2.1-3.0	2.5-3.5	**No change**	
3.1-3.5	3.6-4.0	First high INR – no change in dose. If two consecutive INRs are high, decrease weekly dose by 10-20%	7 days 7 – 14 days
3.6-4.0	4.1-4.5	Reduce weekly dose by 10-20%	
4.1-4.9	4.6-5.0	Stop warfarin for 1 day, reduce weekly dose by 10-20%	7 days
5.0-5.9	5.0-5.9	Stop warfarin for 2 days, reduce weekly dose by 30%	3 days
>6.0	>6.0	Stop warfarin, restart once INR back in therapeutic range, reduce weekly dose by 30%	Check INR in 24hrs
>8.0	>8.0	Stop warfarin, assess for bleeding and bruising, refer to local A&E for administration of vitamin K 2mg	Check INR in 24 hrs

Dose adjustments

- Do not change the dose if a single INR result is slightly out of range (i.e. it is neither very high nor very low).
- Change doses only if there is a trend toward or established lower or higher INR results.
- Choose a lower or higher range depending on the degree of decrease or elevation, historic response of adjustments by patient, the patient's risk profile, and

convenience of dosing (availability of tablets).
- Make adjustments based on total weekly dose.
- Adjustments can be made slightly below or above range (e.g. 5-25%) to accommodate dosing convenience (i.e. rounding of doses to nearest .25 or .5).
- The decision to hold one or multiple doses should be based on the degree of INR elevation, the risk or presence of bleeding, and an assessment of the cause and duration of elevated INR (e.g. if INR will continue to increase based on change in disease or concurrent medications).

Repeating the INR

- 8 weeks is the maximum interval for repeating the INR; it should never be ordered less frequently than this.
- Repeat the INR at least every 8 weeks for INR 1.8-3.2 (target 2.0-3.0) or 2.3-3.7 (target 2.5-3.5).
- There is some flexibility in when to order subsequent INRs after dose changes. Ordinarily, the INR should be rechecked in 3-14 days depending on the various factors (e.g. how high the INR was, the extent of the dose change, the risk of bleeding, etc.)
- An earlier repeat should be done if there is a risk of persistent INR elevation or bleeding.
- If a single INR is slightly out of range and it is decided not to change the warfarin dose, the INR must be repeated in 7-10 days.