**GUIDANCE FOR THE MANAGEMENT OF INRs OUTSIDE THE THERAPEUTIC RANGE**

If the INR is found to be outside the recommended therapeutic range for that patient, **the anticoagulant practitioner will first satisfy him/herself that there are no obvious reasons** for this. **Such reasons may include:**

1. Non-compliance - including missed doses or deviations from the instructed regimen
2. Initiation/Discontinuation (or changes) of an interacting drug
3. Change in diet or alcohol intake
4. Acute worsening in health
5. Increased emotional stress (e.g. moving house, bereavement, family troubles etc.)

### **If a ‘temporary’ reason can be found refer to section 1** *(internal link)*

### **If a ‘permanent’ reason can be found OR if a reason cannot be found at all, refer to section 2** *(internal link)*

### **The maintenance ranges and duration for particular conditions are shown in Chapter** *(internal link -> Monitoring VKAs)*

## Stat loading doses

‘Stat’ loading doses should be 50% greater than the patient’s regular maintenance dose. For example, a patient who is generally stable on an oral anticoagulant dose of 5 mg should receive 7mg (or 8mg) as a stat loading dose. (These are calculated for you in the CDSS). This loading dose of 7mg (or 8mg) is given instead of the usual 5mg – it is NOT additional to it.

## Dosage changes

Adjustments to a patient’s dosage should usually be by ± 10%. (these are calculated for you in the CDSS)

Occasionally it may be appropriate to adjust the dose by ± 20%, particularly during the early stages of oral anticoagulant treatment, when a regular maintenance dose may not have been established.

## Next appointment

For INRs that lie more than 10% outside the therapeutic INR range, the appointment interval should be halved – this will be calculated for you in the CDSS.

INRs that fall into the severe or very severe categories should be seen within **one** week.

# SECTION 1

### **If a temporary reason can be found:**

### The following will generally apply to patients who have previously been stabilised on an oral anticoagulant.

* Document the cause of the deviation in the advisory system
* If appropriate, counsel patient regarding the cause of the deviation - for example, inform patient of the risks associated with sudden increase in alcohol consumption
* In the case of worsening health, the responsible physician at the relevant Hospital should, if possible be contacted prior to dosing

**Correct the INR as soon as possible by using the following tables**

**Temporary reason found out for out of range result**

***E.g. Omitted dose, PRN medication, binge drinking, acute illness***

#### **For lower therapeutic range (2.0 - 3.0):**

***Sub-therapeutic***

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **1.8 - 1.9** | Stat loading dose for 1 day, then as before | As before |
| **Moderate** | **1.5 - 1.7** | Stat loading dose for 2 days, then as before | Half previous interval |
| **Significant** | **≤ 1.4** | Stat loading dose for 3 days, then as before | 1 week |
|  |  |  |  |

###### Over-anticoagulated

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Dose adjustment | **Next Appointment** |
|  |  |  |  |
| **Slight** | **3.1 - 3.3** | Continue as before | As before |
| **Moderate** | **3.4 - 3.7** | Omit dose for 1 day, then as before | Half previous interval |
| **Significant** | **3.8 - 4.5** | Omit dose for 1 day, then as before | Half previous interval |
| **Severe** | **4.6 - 6.0** | Omit doses for 2 days, then as before | 1 week |
| **Very severe** | **> 6.0** | Stop oral anticoagulant | Refer/discuss with relevant Hospital  |
|  |  |  |  |

**The American College of Chest Physicians 2012 Guidelines on antithrombotic therapy suggest that:**

**(a) For patients taking VKAs with INRs between 4.5 and 10 and with no evidence of bleeding - no routine use of vitamin K**

**(b) For patients taking VKAs with INRs > 10.0 and with no evidence of bleeding - administer oral vitamin K**

**Evidence of bleeding may require a change in this advice.**

**Temporary reason found out for out of range result**

***E.g. Omitted dose, PRN medication, binge drinking, acute illness***

#### **For intermediate therapeutic range (2.5 - 3.5):**

###### Sub-therapeutic

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **2.3 - 2.4** | Continue as before | As before |
| **Moderate** | **1.9 - 2.2** | Stat loading dose for 1 day, then as before | Half previous interval |
| **Significant** | **1.3 - 1.8** | Stat loading doses for 2 days, then as before | 1 week |
| **Severe** | **≤ 1.2** | Stat loading doses for 3 days, then as before | 1 week |
|  |  |  |  |

###### Over-anticoagulated

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **3.6 - 3.9** | Continue as before | As before |
| **Moderate** | **4.0 - 4.4** | Omit dose for 1 day, then as before | Half previous interval |
| **Significant** | **4.5 - 5.3** | Omit dose for 1 day, then as before | Half previous interval |
| **Severe** | **5.4 - 7.0** | Omit doses for 2 days, then as before | 1 week |
| **Very severe** | **> 7.0** | Stop oral anticoagulant | Refer/discuss with relevant Hospital |
|  |  |  |  |

**The American College of Chest Physicians 2012 Guidelines on antithrombotic therapy suggest that:**

**(a) For patients taking VKAs with INRs between 4.5 and 10 and with no evidence of bleeding - no routine use of vitamin K**

**(b) For patients taking VKAs with INRs > 10.0 and with no evidence of bleeding - administer oral vitamin K**

**Evidence of bleeding may require a change in this advice.**

**Temporary reason found out for out of range result**

***E.g. Omitted dose, PRN medication, binge drinking, acute illness***

#### **For upper therapeutic range (3.0 - 4.0):**

***Sub-therapeutic***

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **2.7 - 2.9** | Continue as before | As before |
| **Moderate** | **2.3 - 2.6** | Stat loading dose for 1 day, then as before | Half previous interval |
| **Significant** | **1.5 - 2.2** | Stat loading doses for 2 days, then as before | 1 week |
| **Severe** | **≤ 1.5** | Stat loading doses for 3 days, then as before | 1 week |
|  |  |  |  |

###### Over-anticoagulated

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **4.0 – 4.5** | Continue as before | As before |
| **Moderate** | **4.6 – 5.6** | Omit dose for 1 day, then as before | Half previous interval |
| **Significant** | **5.7 - 6.9** | Omit doses for 2 days, then as before | 1 week |
| **Severe** | **> 7.0** | Stop oral anticoagulant | Refer/discuss with relevant Hospital |
|  |  |  |  |

**The American College of Chest Physicians 2012 Guidelines on antithrombotic therapy suggest that:**

**(a) For patients taking VKAs with INRs between 4.5 and 10 and with no evidence of bleeding - no routine use of vitamin K**

**(b) For patients taking VKAs with INRs > 10.0 and with no evidence of bleeding - administer oral vitamin K**

**Evidence of bleeding may require a change in this advice.**

**.**

# SECTION 2

### **If a permanent reason can be found OR a reason cannot be found at all:**

Document in the advisory system that a permanent cause has been found or that no reason can be found at all.

* Clearly state that you have questioned the patient on changes to
* Medication (including missed doses)
* Diet
* Health
* Emotional stress
* Exercise
* In the case of worsening health, the responsible clinician should if possible be contacted prior to dosing

Adjust the dose as directed in the following tables

Either a Permanent reason found

*E.g. Long-term medication changes, long-term health changes*

Or no reason found at all for out of range result

#### **For lower therapeutic range (2.0 - 3.0):**

###### Sub-therapeutic

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **1.8 - 1.9** | Stat loading dose for 1 day, then ⇧ dose | As before |
| **Moderate** | **1.5 - 1.7** | Stat loading dose for 2 days, then ⇧ dose | Half previous interval |
| **Significant** | **≤ 1.4** | Stat loading dose for 3 days, then ⇧ dose | 1 week |
|  |  |  |  |

###### Over-anticoagulated

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
|  |  |  |  |
| **Slight** | **3.1 - 3.3** | Continue as before | As before |
| **Moderate** | **3.4 - 3.7** | Omit dose for 1 day, then ⇩ dose | Half previous interval |
| **Significant** | **3.8 - 4.5** | Omit dose for 1 day, then ⇩ dose | Half previous interval |
| **Severe** | **4.6 - 6.0** | Omit doses for 2 days, then ⇩ dose | 1 week |
| **Very severe** | **> 6.0** | Stop oral anticoagulant | Refer/discuss with relevant Hospital |
|  |  |  |  |

##### Evidence of bleeding may require a change in this schedule

Either a Permanent reason found

*E.g. Long-term medication changes, long-term health changes*

Or no reason found at all for out of range result

#### **For intermediate therapeutic range (2.5 - 3.5):**

###### Sub-therapeutic

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
| **Slight** | **2.3 - 2.4** | Continue as before | As before |
| **Moderate** | **1.9 - 2.2** | Stat loading dose for 1 day, then ⇧ dose | Half previous interval |
| **Significant** | **1.3 - 1.8** | Stat loading doses for 2 days, then ⇧ dose | 1 week |
| **Severe** | **≤ 1.2** | Stat loading doses for 3 days, then ⇧ dose | 1 week |

###### Over-anticoagulated

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
| **Slight** | **3.6 - 3.9** | Continue as before | As before |
| **Moderate** | **4.0 - 4.4** | Omit dose for 1 day, then ⇩ dose | Half previous interval |
| **Significant** | **4.5 - 5.3** | Omit dose for 1 day, then ⇩ dose | Half previous interval |
| **Severe** | **5.4 - 7.0** | Omit doses for 2 days, then ⇩ dose | 1 week |
| **Very severe** | **> 7.0** | Stop oral anticoagulant | Refer/discuss with relevant Hospital |
|  |  |  |  |

**Evidence of bleeding may require a change in this schedule.**

Either a Permanent reason found

*E.g. Long-term medication changes, long-term health changes*

Or no reason found at all for out of

range result

#### **For upper therapeutic range (3.0 - 4.0):**

***Sub-therapeutic***

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
| **Slight** | **2.7 - 2.9** | Continue as before | As before |
| **Moderate** | **2.3 - 2.6** | Stat loading dose for 1 day, then ⇧ dose | Half previous interval |
| **Significant** | **1.5 - 2.2** | Stat loading doses for 2 days, then ⇧ dose† | 1 week |
| **Severe** | **≤ 1.5** | Stat loading doses for 3 days, then ⇧ dose† | 1 week |

###### Over-anticoagulated

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Dose adjustment** | **Next Appointment** |
| **Slight** | **4.0 – 4.5** | Continue as before | As before |
| **Moderate** | **4.6 - 5.6** | Omit dose for 1 day, then ⇩ dose | Half previous interval |
| **Significant** | **5.7 - 6.9** | Omit doses for 2 days, then ⇩ dose | 1 week |
| **Severe** | **> 7.0** | Stop oral anticoagulant | Refer/discuss with relevant Hospital  |
|  |  |  |  |

##### Evidence of bleeding may require a change in this schedule