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| **Module** | Management of VKAs (HCP) |
| **Topic** | The use of anticoagulants for stroke prevention |
| **Audience** | Healthcare professional |
| **Type** | Case studies |
| **Version** | 2 |

**1. Introduction**

There now follows a set of short case studies, reflecting an anticoagulation consultation. Please answer the questions for each scenario.

This exercise forms part of your course assessment.

**2. Assessment aim and objectives**

The aim of this assessment is to test your knowledge of the management of oral anticoagulants and your skill in adjusting doses of warfarin.

The objectives are to demonstrate competence in the following:

1. Management of a high INR
2. Management of a low INR
3. Identification of common reasons for under-anticoagulation
4. Identification of common reasons for over-anticoagulation
5. Management of minor bleeding resulting from over-anticoagulation
6. Management of major bleeding resulting from over-anticoagulation
7. Management of suspected venous thromboembolism resulting from under-anticoagulation

**Case study 1**

*(insert stock photo of man)*

GH is a 72 year-old man who is taking warfarin after being diagnosed with atrial fibrillation. His target INR is 2.5. His last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval**

**(days**)

24th August 3.0 3.5 14

9th September 2.5 3.5 28

8th October 2.4 3.5 42

17th November 2.7 3.5 56

## GH sees you on 12th January (i.e. 56 days after last appointment). His INR result is 2.3.

1. What dose of warfarin would you advise GH to take?

**3.5 mg**

2. In how many days should he return for another INR test?

**56 or 70 days**

3. GH is unhappy about the need to have blood tests to monitor his treatment and asks you if he could switch to aspirin. What would you advise?

1. Aspirin is a good alternative to warfarin for him
2. Aspirin would only be recommended if he was unable to take warfarin
3. **Aspirin is not recommended as an alternative to warfarin for stroke prevention**

**Case study 2**

*(insert stock photo of woman)*

MW is a 75 year-old woman who is taking warfarin and has had a previous stroke and TIAs. Her target INR is 2.5.

Her current prescription is:

Bendrofluazide 2.5 mg each morning

Lisinopril 10 mg each morning

Her last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval**

**(days)**

1st September 2.9 5.0 14

15th September 3.0 5.0 28

13th October 2.6 5.0 35

1st December 3.0 5.0 42

## MW sees you on 13th January (i.e. 42 days after last appointment). Her INR is 5.0.

Today she is complaining of shortness of breath. Her regular medication has not changed since her last visit and she has not bought any medicines over-the-counter.

1. Please list the possible causes of her high INR?

1. **Exacerbation of heart failure**
2. **Non-compliance (taking too much warfarin)**
3. **Excess alcohol**

2. What do you think is the most likely cause of her high INR?

1. **Exacerbation of heart failure**

3. What dose of warfarin would you advise MW to take?

**Omit 2 doses then 5 mg**

4. In how many days should she return for another INR test?

**7 days**

**Case study 3**

*(insert stock photo of woman)*

DK is a 54 year-old woman who is taking warfarin following a DVT. Her target INR is 2.5. Her last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval**

**(days)**

16th September 1.9 3.5 14

27th September 2.5 4.0 28

21st October 2.3 4.0 42

25th November 2.0 4.0 42

DK sees you on 13th January (i.e. 42 days after the last appointment). Her INR is 4.1.

Her regular prescription: Ramipril 5 mg daily

Furosemide 80mg each morning

Ranitidine 150 mg twice daily

1. What questions would you need to ask DK to establish the reason for her high INR?

1. **Confirm dose taken**
2. **Medication changes**
3. **Changes in alcohol intake**
4. **Dietary changes**
5. **Health changes (e.g. exacerbation of heart failure)**

*(on response reveal next part of the case ->)*

DK tells you that she is taking clarithromycin for treatment of chest infection (she is 6 days into a one-week course).

2. What dose of warfarin would you advise DK to take?

**Omit one dose of warfarin and then 4mg**

3. In how many days should she return for another INR test?

**14, 21 or 28 days**

**Case study 4**

*(insert stock photo of man)*

JN is a 64 year-old man who is taking warfarin, has atrial fibrillation and has had a TIA. His target INR is 2.5. His last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval**

**(days)**

22nd September 3.0 4.0 14

6th October 2.4 4.0 28

3rd November 1.9 4.0 14

17th November 1.9 4.0 14

JN sees you on the 1st December (i.e. 14 days after the last appointment); his INR is 1.3.

1. What questions would you need to ask JN before providing dosing advice?

1. **Confirm treatment compliance**
2. **Medication changes**
3. **Dietary changes**
4. **Health changes … e.g. Diarrhoea or vomiting**

*(on response reveal next part of the case ->)*

One week ago, JN tell you that he had been advised by his respiratory consultant to start taking TB treatment.

2. Which TB medication can lower the INR?

**Rifampicin**

3. Why does this medication lower the INR?

**By inducing liver enzymes, increasing the metabolism of warfarin**

4. What dose of warfarin would you advise JN to take?

**Take 6mg for three days then 4.5mg daily (4mg / 5mg on alternate days)**

5.In how many days should he return for another INR test?

**7 days**

**Case study 5**

*(insert stock photo of man)*

SH is a 58 year-old man who is taking warfarin following a second deep vein thrombosis whilst on warfarin. His target INR is 3.5. His last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval**

**(days)**

28th September 2.8 4.5 28

26th October 2.9 4.5 21

16th November 4.3 3.5 7

23rd November 3.3 3.5 35

SH sees you on 28th December (i.e. 35 days after the last appointment). His INR is 4.6

SH informs you that he has been prescribed allopurinol to manage his gout. This was started 2 weeks ago.

1. When administered to a warfarin patient, what is the effect of allopurinol on the INR?

**Increases the INR**

2. What dose of warfarin would you advise Mr H to take?

**Omit one dose of warfarin then take 3mg daily.**

3.In how many days should he return for another INR test?

**14 days**

4. What other questions should you ask SH?

**Ask about signs of bleeding – e.g.nose bleeds, bruising, blood in urine (haematuria), blood in stools (malaena), headaches**

*(on response reveal next part of the case ->)*

SH has suffered a nosebleed (lasting 5 minutes) for two consecutive days, and is concerned that the warfarin is responsible for this.

5. What advice would you give to SH about his nosebleeds?

**Provide reassurance**

**First-aid measures**

6. What advice would you give SH to manage his nosebleed if it lasts for more than half an hour?

**Seek immediate medical attention. Go to nearest A&E.**

**Case study 6**

*(insert stock photo of woman)*

JI is a 52 year-old woman who has atrial fibrillation and cardiomyopathy. Her target INR is 2.5. Her last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval (days)**

4th September 7.7 0.0 3.0

7th September 4.6 6.0 5.0

14th September 1.5 7.0 7.0

21st September 3.7 6.0 7.0

On 28th September her INR result is 6.9

JI is partial to a ‘few bottles of wine’ at the weekend.

She is unaware of the problems associated with warfarin and alcohol and on discussion, does not perceive this to be an issue.

1.What questions would you ask JI?

**Ask about signs of bleeding – e.g.nose bleeds, bruising, blood in urine (haematuria), blood in stools (malaena), headaches**

She admits to noticing spontaneous bruising to her thighs and has had two nosebleeds in the last week.

2. How would you now manage JI today?

**Discuss with a specialist / senior member of team / GP / Consultant**

*(on response reveal next part of the case ->)*

You discuss JI with the consultant in the anticoagulant clinic. He is confident that she is not having a major bleed and that she should be managed through careful counseling and her INR brought back into her therapeutic range.

3. What dose of warfarin would you advise JI to take?

**Omit three doses of warfarin then take 6 mg daily.**

4.In how many days should she return for another INR test?

**7 days**

5. What is the recommended maximum number of units of alcohol per day for a woman who is taking warfarin?

**2 units**

6. What further advice would you give to JI about drinking alcohol whilst taking warfarin?

**Alcohol increases INR and risk of bleeding**

**Advise against big variations in the amount she drinks from day to day / no binge drinking**

**Let anticoagulant practitioner know if she has changed her alcohol intake since last blood INR test.**

**Case study 7**

*(insert stock photo of man)*

SW is a 54 year-old man who is taking warfarin following a second deep vein thrombosis whilst on warfarin. His target INR is 3.5. His last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval (days)**

28th September 3.2 4 28.0

26th October 2.9 4 28.0

23rd November 3.7 4 28.0

22nd December 3.3 4 28.0

On 19th January (i.e. 28 days after the last appointment]. His INR is 1.4

As his New Year’s resolution, SW has decided on a healthier lifestyle and is eating more sensibly to lose weight; ‘ less meat and more vegetables.’

1. What do you think has caused SW’s low INR on this occasion?

**Dietary changes (eating more green vegetables)**

2. What dose of warfarin would you advise SW to take?

**Take 6mg for three days and then 4.5mg daily.**

3.In how many days should he return for another INR test?

**7 days**

4. What advice would you give SW concerning his new diet?

**Encourage healthy diet**

**Consistent intake of vitamin K rich foods**

On further questioning, SW tells you that he has pain and tenderness in his left calf.

**5. What should you do next?**

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| 1. Advise him to take an OTC analgesic (paracetamol is best) |
| 1. Ask him to phone you if the pain gets worse |
| 1. **Refer him immediately to the hospital / emergency department** |
| 1. Advise him to keep the leg elevated and wear compression hosiery |

**Case study 8**

*(insert stock photo of man)*

AB is a 67 year-old man who is taking warfarin following a pulmonary embolism. His target INR is 2.5. His last four clinic visits are summarised below:

**Date INR Test Drug dose Monitoring interval (days)**

28th September 2.8 14.5 28.0 days

28th October 2.9 14.5 42.0

9th December 5.0 13.5 7.0

16th December 3.3 13.5 28.0

On 13th January his INR result is 1.6

He tells you that he has been short of breath for the past 24 hours.

Regular prescription:

Paracetamol 1 g four times each day

Donepezil 5 mg each morning

Codeine 15 mg each night PRN

New prescription started 2 weeks ago:

Carbamazepine 100 mg three time each day for

pain relief

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| 1. | List three possible causes for AB’s low INR? |
| i | **Addition of carbamazepine** |
| ii | **Non-compliance** |
| Iii | **Dietary changes (increased vitamin K intake)** |
| 2. | How would you manage his shortness of breath? |
| a | **Refer him to the hospital / emergency department immediately** |
| b | Ask him to make an appointment to see his GP |
| c | Ask him to phone you if the shortness-of-breath gets worse |
| d | Make an appointment to see him the following day  3. How would you manage his low INR?  i. Give him a loading dose for one day and then increase his dose of warfarin  ii. Give him a loading dose for one day and then ask him to continue on the same dose of warfarin  iii. Ask him to increase his dose of warfarin to 16mg daily  **iv. Seek specialist advice before managing him** |

*(on response reveal next part of the case ->)*

He is then seen by a Haematologist who is confident that he has not has another PE, and prescribes him a low molecular weight heparin as bridging therapy.

4. What dose of warfarin would you recommend whilst he is on his bridging therapy?

1. 13.5mg
2. 11mg
3. **15mg**
4. 20mg
5. None

5. When can you ask him to stop his heparin treatment?

1. **Once he is in his target INR range**
2. When his shortness of breath has resolved
3. After two consecutive INR readings in therapeutic range