STANDING ORDERS FOR THE MANAGEMENT OF WARFARIN

Dose adjustment and INR testing frequency

Applicable to: Pharmacists Standing Order used for the Community Pharmacy Anticoagulant Management Service (CPAMS) 24 October 2013 Revised 1 May 2017 for Canada	Issued by: Medical Advisor, Community Pharmacy Anticoagulation Management Service Contact: Dr Murray Trusler, 1-250-688-1367 or inronline.ca@hotmail.com

Purpose

To improve the safety of warfarin management by providing anticoagulant control through a pharmacist led service using point of care testing (CoaguChek XS Pro) and online computer decision support (INR Online Canada Limited).

The standing order is required to enable pharmacists to supervise anticoagulant management, and must be signed by the general practice prior to commencing services.

Scope

Accredited pharmacists who are participating in the Community Pharmacy Anticoagulation Management Service (CPAMS).

Medicine

Name of Medicine

Warfarin

Indications

Anticoagulation therapy initiated or confirmed by a doctor for:

1. Atrial Fibrillation
2. Deep vein thrombosis
3. Pulmonary Embolus
4. Tissue Heart valve
5. Mechanical Heart valve
6. Mural thrombus
7. Transient ischaemic attack
8. Post myocardial infarction

Method of Administration: Oral
Dosage : see below

Contraindications

1. High risk of haemorrhage: active ulceration, overt bleeding of gastrointestinal, genitourinary or respiratory tracts, cerebrovascular haemorrhage, cerebral aneurysm.
2. Pregnancy.

Side effects

High incidence of drug interactions

Haemorrhage; GI upset; fever; dermatitis; urticaria; alopecia. hypersensitivity.

Test Procedure

Consent

All patients must be referred to the community pharmacy anticoagulant management service by the prescribing doctor.

All patients must give informed consent.

Safety

All patients are to be asked about signs and symptoms of bleeding (haematuria, blood in bowel motions, severe bruising, mucosal haemorrhage etc).

- If there is minor bleeding the doctor should be informed and the patient reviewed if necessary.
- If the patient has significant bleeding the doctor should be informed immediately.

All patients are to be asked about new medication including OTC medications and/or other complementary medicines since the previous INR test.

- If a significant interaction is identified the doctor should be informed and the patient reviewed if necessary.

All patients are to be asked about warfarin compliance.

- If a significant number of doses have been omitted the doctor should be informed.

All patients are to be asked if they have been admitted to hospital since their previous INR test. Details of the reason for admission will be recorded.

Referral criteria for new patients

Referral criteria for new patients

Referral to the service is at the discretion of the General Practitioner. If the doctor believes a specific patient requires close supervision, the doctor should indicate this to the pharmacist and arrange a process of individualized "shared care". This could involve more frequent consultation with the doctor during the period of instability.

Criteria for discontinuing services

Criteria for discontinuing services and referral back to general practice

Once a patient is referred to CPAMS it is best practice that they remain with pharmacist management unless the doctor or pharmacist elects to remove them, or the patient chooses an alternative service, or the medication is discontinued or replaced.

The patient should only be referred back to the GP after consultation between the GP and pharmacist. The reasons for referral back to the GP care are most likely to relate to poor control or poor compliance. Where possible, a shared care arrangement with close supervision should be considered.

Dose Adjustment

Dose recommendation

Dose recommendation and interval to next INR test to be determined using INR Online software at the time an INR result is entered from the point of care device (CoaguChek XS Pro with direct data connection).

The recommended dose can be accepted by the supervising pharmacists if the INR is within a specified range.

Parameters for warfarin adjustment

All patients must have a specified target INR and treatment range
An upper and lower INR value that will trigger a REVIEW must be set for each patient.
The default values: lower INR – 1.5 upper INR – 4.0 will be used unless otherwise specified by the doctor.
The pharmacist can accept the dose recommendation made by INR Online for INR values between the lower and upper limits.
INR values outside the upper and lower limits will be referred for review by the doctor.
An INR >4.5 will automatically advise the patient to miss 1 dose of warfarin and recommend a test the following day.
The pharmacist can contact the supervising doctor and discuss any dose recommendation if he or she believes that the dose recommendation is inappropriate for the patient.
The pharmacist must document in the notes box in INR Online the reasons for any deviation in dose recommendation

Test interval

A maximum test interval must be set for each patient. The default value of 28 days will be used unless otherwise specified by the doctor. For patients with stable control the maximum interval can be increased to 42 days after consultation with the doctor.
The test interval varies depending on the patient's anticoagulant control.
The system automatically reduces the test interval when the INR is outside the treatment range. The test interval increases in a step wise manner if the INR remains in range up to the maximum (42 days).
The pharmacist can recommend a shorter test interval at any time if he or she believes an earlier test is appropriate.
The pharmacist must document in the notes box in INR Online the reasons for any deviation in the test interval recommendation.

The pharmacist will provide the patient with advice about the warfarin dose and the date of the next INR test, and provide a printed dosing calendar.

Starting warfarin

The INR Online software provides a protocol to assist with warfarin loading and initial stabilization.

This stage of treatment can be supervised by the pharmacist, but close consultation with the supervising doctor is recommended.

Review process

Where the INR is outside the specified range, the INR-Online software will automatically set the result for review:

The pharmacist can accept the recommended dose from INR Online and advise the patient that the result has been sent for review by their doctor.

The patient is advised to continue on the recommended dose unless they are informed otherwise. If their doctor wishes to modify the dose they will be informed of the change either by e-mail or by telephone by the pharmacist.

Medical Review

Medical review

If a patient has an INR result outside the specified safe range, the supervising doctor will be informed by e-mail. The contents of the message will include:

The latest INR result

The recommended dose

The date of the next test

A graph showing recent warfarin control

A list of previous results to enable the doctor to appropriately review the new dose.

A link to open INR Online on the appropriate page to enable the doctor to edit the dose or date of the next test.

The doctor has two options on reviewing the result:

1. Acknowledge result

   If the doctor agrees with the recommendation made by the INR Online software or the pharmacists, the doctor will need to acknowledge that the result has been seen by clicking on a link in the notification. No further action will need to be taken. The patient will have been informed of the dose and the date of the next test.

2. Modify the recommendation

   If the doctor wishes to modify the dose or date of next test a web-page link is provided in the review message to take the doctor directly to the review page.

   The doctor can then change the dose or date of the next test and confirm the change.

   The pharmacist who entered the result will automatically be notified by e-mail that the dose or date has been changed. If the patient has e-mail the patient will also be informed.

   The doctor does not need to take any further action.

   The responsibility to inform the patient rests with the pharmacist.

The review must be completed within 24 hours of the INR test.

Warfarin Reversal

Managing High INR Results

All INR results >4.0 will trigger a review message to the doctor

If the INR is >4.5 INR Online will recommend missing a dose and repeating a test the following day

If the INR is >5.0

- INR Online will provide advice for warfarin reversal in line with the Australasian Guidelines (Appendix 2).
- All results should be discussed with the supervising doctor
- If the guidelines recommend treatment with vitamin K, this must be discussed with the supervising doctor. Vitamin K can only be given

with authorization from the supervising doctor.

IF A PATIENT HAS SIGNIFICANT BLEEDING

- Refer to the hospital immediately.
- Inform the supervising doctor.
- Consider giving 10mg oral vitamin K if there is significant travel time to the nearest hospital. Vitamin K can only be given with authorization from the supervising doctor.

NB: Significant bleeds include: Blood in the urine, Blood in the bowel motions, A prolonged nose bleed, large bruises (bigger than 4cm in diameter).

Many patients on warfarin have minor bleeds, such as gum bleeding, spotting from the nose, or easy bruising. These do not need urgent attention.

Record keeping

Recording results

The INR result, dosage of warfarin and testing interval are to be recorded in the INR-Online software and the same information will be sent automatically to the doctor's email address.

INR Online automatically records the date, time and user, when results are entered or any changes made.

Adverse events are recorded during the assessment prior to each test and additional information can be recorded in a notes field with each INR test.

Countersign period

The Doctor initiating anti-coagulation therapy will sign off treatment. Sign off will take place every 3 months at the time a new warfarin prescription is provided.

Training and Competency Assessment

Prior to administering Warfarin dose titration under this Standing Order, Accredited pharmacists are required to have completed the MOAT Training Program at the University of Waterloo including CoaguChek XS Pro competency training.

Process for audit and review

The issuer will review the Standing Order at least once a year.

Pharmacies must also annually review and affirm that they are operating according to this Standing Order.

Program data will be monitored, and adverse events related to the Service will be reported to a relevant body by the Clinical Director.

Responsibility for Review

Dr. Murray Trusler is responsible for review of this Standing Order.

Time period for which the Standing Order is valid

This Standing Order is valid until it is replaced by a new Standing Order or cancelled by the issuer.

Limitations

This standing order only applies to Pharmacists who are accredited to provide community pharmacy anticoagulant management services.

Standing order prepared by
Dr P L Harper. MD, FRCP, FRACP, MRCPath.
Consultant Haematologist, Palmerston North Hospital
Honorary Senior lecturer, Auckland University and Dr.
Murray Trusler, MD, MBA, FCFP, FRRMS.

In collaboration with:
Prof John Shaw, Head of School of Pharmacy, Auckland University
Prof Les Toop, Head of Dept Public Health and General Practice, University of Otago
Elizabeth Plant, President, Pharmaceutical Society of New Zealand
Richard Townley, CEO, Pharmaceutical Society of New Zealand
Dale Griffiths, Pharmacist Ian
McMichael, Pharmacist Amanda
Kiss, Clinical facilitator.

Consent

By signing this standing order you are consenting to allowing patients at this practice to continue management of their warfarin using a Community Pharmacy Anticoagulant Management Service.

I confirm I have read these Standing Orders, and consent to referring selected patients in the practice to:

_____Pharmacy

for Community Pharmacy Anticoagulation Management Services.

NB – this Standing Order may be signed by the practice Clinical Director on behalf of all medical practitioners in the practice, or alternately signed by each doctor.

PRACTICE: _____

Name of doctor:……

Signed:……Date:……

Name of doctor:……

Signed:……Date:……

Name of doctor:……

Signed:……Date:……

Name of doctor:……

Signed:……Date:……

Name of doctor:……

Signed:……Date:……

Annual Review[1] of the Standing Order by the Issuer

Date	Person reviewing the Standing Order on behalf of the General Practice	Signature

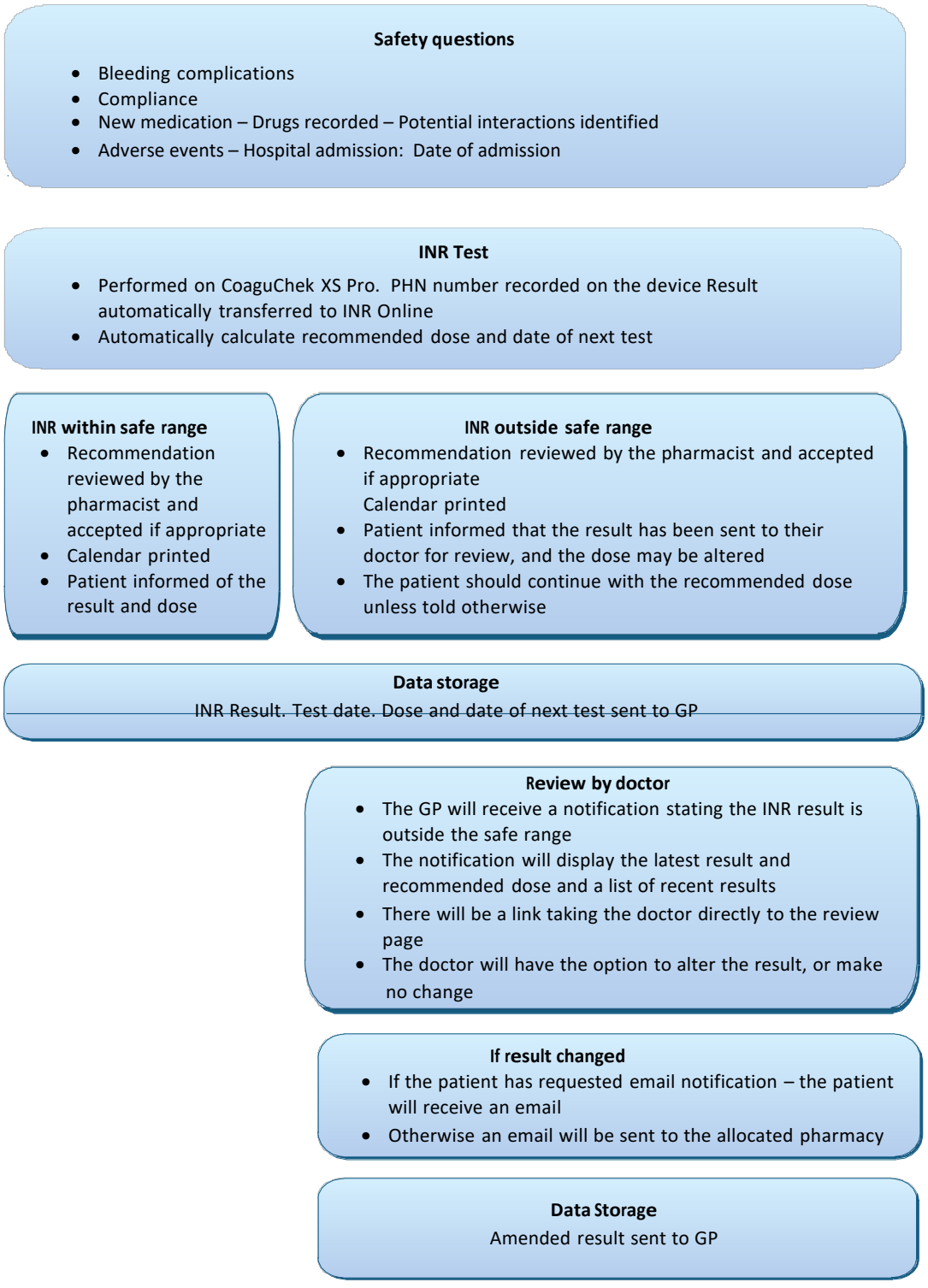
[1] Annual review of the Standing Order by the Issuer is a requirement in the *Medicines (Standing Order) Regulations 2002.*

Appendix 1

Summary of the testing process

The patient attends their allocated pharmacy.
The patient is interviewed by the pharmacist.
The patient is identified on INR Online (search by PHN or name)

CPAMS – Overview of the Test Process



Appendix 2

Guidelines for the management of an elevated international normalized (INR) in adult patients with or without bleeding

Clinical Setting	Action
INR higher than the therapeutic range, but <5.0; bleeding absent	- Lower the dose or omit the next dose of warfarin. Resume therapy at a lower dose when the INR approaches the therapeutic range. - If the INR is only minimally above the therapeutic range (up to 10%), dose reduction may not be necessary.
INR 5.0-9.0[1]; bleeding absent	- Cease warfarin therapy; consider reasons for elevated INR and patient-specific factors. - If bleeding risk is high, give vitamin K[2] (1.0-2.0mg orally or 0.5-1.0mg intravenously). - Measure INR within 24 hours, resume warfarin at a reduced dose once INR is in therapeutic range.
INR >9.0; bleeding absent	- Where there is a low risk of bleeding, cease warfarin therapy, give 2.5-5.0mg vitamin K[2] orally or 1.0mg intravenously. Measure INR in 6-12 hours, resume warfarin therapy at a reduced dose once INR <5.0. - Where there is a high risk of bleeding[3], cease warfarin therapy, give 1.0mg vitamin K[2] intravenously. Consider 4 Factor PCC (25-50IU/kg) and fresh frozen plasma (150-300mL), measure INR in 6-12 hours, resume warfarin therapy at a reduced dose once INR <5.0.
Any clinically significant bleeding where warfarin-induced coagulopathy is considered a contributing factor	- Cease warfarin therapy, give 5.0-10.0mg vitamin K[2] intravenously, as well as 4 Factor PCC (25-50IU/kg) and fresh frozen plasma (150-300mL), assess patient continuously until INR <5.0, and bleeding stops[4]. OR - If fresh frozen plasma is unavailable, cease warfarin therapy, give 5.0-10.0mg vitamin K[2] intravenously, and 4 Factor PCC (25-50IU/kg), assess patient continuously until INR <5.0, and bleeding stops[4]. OR - If 4 Factor PCC is unavailable, cease warfarin therapy, give 5.0-10.0mg vitamin K[2] intravenously, and 10-15ML/kg of fresh frozen plasma, assess patient continuously until INR <5.0, and bleeding stops[4].

1. Bleeding risk increases exponentially from INR 5 to 9. INR greater or equal to 6 should be monitored closely.
2. Vitamin K effect on INR can be expected within 6-12 hours.
3. Examples of patients in whom the bleeding risk would be expected to be high include those with active gastrointestinal disorders (such as peptic ulcer or inflammatory bowel disease), those receiving concomitant antiplatelet therapy, those who underwent a major surgical procedure within the preceding two weeks, and those with a low platelet count.
4. In all situations carefully reassess the need for ongoing warfarin therapy.

Ref: R I Baker, P B Coughlin, Al S Gallus, P L Harper, H H Salem and E M Wood. The Warfarin Reversal Consensus Group. Warfarin reversal: consensus guidelines, on behalf of the Australasian Society of Thrombosis and Haemostasis. MJA 2004; 181: 492–497

Appendix 3

Procedure to manage patients when unable to communicate with INR Online

The following procedure should be followed if access to INR Online is interrupted due to local computer problems, lost internet connection, problems with the INR Online server, or the INR Online program stops running.

1. Interview patient and record as a hard copy any missed medication, history of bleeding since the last visit, new medication since the last visit and any hospital admissions.

2. Perform the INR test as usual on the CoaguChek XS Pro. Enter the PHN number if known. If the patient does not know their PHN Number perform the INR test without a reference number.

3. Record the following information as a hard copy
   Patient's name,
   PHN number (if known) or date of birth
   Present warfarin dose
   INR result
   Patient's GP details

INR within the therapeutic range

If the INR is within the therapeutic range, advise the patient to continue on the same dose and recommend a dose interval the same as the previous interval.
Record the dose recommended and the date of the next test

If the INR Is outside the therapeutic range

Warfarin dosing is the responsibility of the patient's general practitioner. You should therefore contact the GP practice, advise them that you are unable to contact INR Online and require dosing advice.
The dose recommendation from the doctor and the date of the next test should be recorded and the patient should be contacted with this information.

If the INR is >4.5, advise the patient to miss a warfarin dose and repeat the INR the next day.

When access is resumed

The missing results should be entered into INR online.

Enter the results by using the *add result* tab on the top of the left-hand column on the overview page.

This will ensure that the results are sent to the doctor's email address and an e-mail will be sent to the patient.

When you enter a result the computer will recommend a new dose. Edit this to the dose you gave and edit the recommended date of the next test to the date you recommended. Then confirm the result.

DO NOT ENTER THE MISSING RESULT USING THE *EDIT RESULT* TAB. If you do, the result will not be sent to the doctor and the patient will not receive an e-mail.

Appendix 4

Procedure for the management of non-compliant patients

Note: The responsibility for the patient's warfarin management rests with the supervising doctor.

It is important that the supervising doctor is informed if a patient is a regular poor complier. It may be appropriate for the doctor to reassess the risks and benefits of warfarin in such cases and may recommend discontinuing warfarin if the risk of poor compliance is assessed to be potentially dangerous.

The following is a recommended procedure for managing non-attenders. Where possible we suggest this is followed but individual patient circumstances must be considered with these recommendations. It is important to document all deviations from the procedure and to maintain good communication with the supervising doctor.

Procedure if patient fails to attend for INR testing on the specified date

As a general rule the patient should go no more than 6 weeks between tests.

If the patient fails to attend within 3 days of the specified test date, the patient should be contacted by phone to remind the patient that the test is due.

If the patient fails to attend within 4 to 6 days of the first reminder, a second call should be made to the patient.

If the patient fails to attend within 1 week of the second reminder, the patient should be contacted a third time and the patient's doctor should be informed that the test is 2 weeks over due and a maximum of 6 weeks since the last test and you will only send further reminders at the doctor's request. Further follow up of the patient is the responsibility of the doctor.

Each contact with the patient and the doctor should be documented in INR Online.

If a patient presents for a test more than 2 weeks after the expected date of the test, the test should be performed and the doctor should be informed.

If a patient regularly fails to attend on time, discuss management with the supervising doctor.