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| **Module** | Anticoagulation management: patient’s guide to self-monitoring |
| **Topic** | Near-patient testing |
| **Audience** | Self-monitoring warfarin patient |
| **Type** | Core content |
| **Version** | 6 |

**1. What should I learn from this topic?**

The aim of this topic is to give you the knowledge and skills to allow you to safely choose and use a coagulometer.

By the end of this topic you should be able to do the following:

1. State the differences between the traditional INR test and near-patient testing
2. Demonstrate how to set up a coagulometer
3. Use the coagulometer to successfully measure your INR
4. List some of the factors that might result in a false INR reading
5. Summarise what you should do if there are technical problems with the coagulometer
6. Describe how used test strips and other clinical waste should be handled

**2. Check your understanding**

However, you may know much of this information already. Therefore, please try to answer the following questions *(correct responses bolded)*.

a) Near-patient testing (NPT) is different from the traditional INR test in the following ways:

1. NPT uses a fingerprick blood sample but the traditional INR test uses a sample of blood from the vein

**True** / False

1. NPT is quicker than a traditional INR test

**True** / False

1. NPT is more accurate than the traditional INR test

True **/ False**

b) Which of the following factors may result in a false INR reading (please select all that apply)?

1. **If you are anaemic**
2. Hot weather
3. **Squeezing your finger to get a blood sample**
4. Cold weather
5. High blood pressure

c) Which of the following might be able to help you if you had a technical problem with your coagulometer? (please tick all that may apply)

**i) Your anticoagulation healthcare professional**

**ii) The manufacturer of your coagulometer**

**iii) Your coagulometer user manual**

d) You can dispose of your blood lancets, test strips and cotton wool with your household waste?

True / **False**

**3. What is near-patient testing?**

Near-patient testing (NPT) is when medical testing is carried out near to you. It is also known as point-of-care testing (POCT). The development of small, portable, accurate meters allows us to use NPT to monitor some conditions; for example, blood glucose meters for diabetes. The main benefits of NPT are that it is quick, and it allows you to monitor your condition or treatment at a location that is convenient to you.

**4. How can I use near-patient testing to monitor my INR?**

With the traditional INR test, a healthcare professional inserts a needle into your arm to draw a small tube of blood, which is then sent to the hospital laboratory for analysis. However, increasingly, NPTmachines are being used in hospital clinics, GP surgeries, community pharmacy clinics and by people in their own homes.

These machines are called coagulometers,or aresometimes called fingerprick-testing machines. You insert a test strip into the machine, prick your finger and then apply a drop of blood to the test strip. The result of the INR test is usually available within a couple of minutes.

If you are considering buying a coagulometer, it is important that you make sure that it has been tested and approved by the regulatory authorities in the UK.

Currently, there are two coagulometers for use by patients that have been approved: CoaguChek® XS and INRatio® 2. To find out more about them, and to get current prices, please contact the relevant manufacturer. It is essential that you buy your coagulometer from a reputable source, preferably direct from its manufacturer.

 **CoaguChek® XS** **by Roche Diagnostics.**

Tel: 0808 100 7666 or visit [www.coaguchek.com](http://www.coaguchek.com/)

                                        

This should not be confused with another Roche coagulometer called CoaguChek® XS Plus, which is designed for use by healthcare professionals

 **INRatio® 2 by Alere.**

Tel: 0161 4835884 or visit [www.alere.com](http://www.alere.com/)

**5. How do I test my INR?**

It is essential that you are able to set up and use your coagulometer correctly.

When you purchase your coagulometer, its manufacturer provides comprehensive educational material on its use. This is valuable reference material. Further information is available on each manufacturer’s website.

Your anticoagulant clinic may also provide training on using your coagulometer.

There are excellent videos available that take you through the self-testing process step-by-step. Please select the coagulometer you will be using and then follow the instructions *(need to ‘steer’ user through path here?)*

**5.1 Using CoaguChek® XS**

If you are using a **CoaguChek® XS**  coagulometer please watch the following video, which will show you how to set it up.

*(->* [*http://www.youtube.com/watch?v=hgBZkXJzpWI*](http://www.youtube.com/watch?v=hgBZkXJzpWI))

**DEMONSTRATE YOUR SKILL**

Now try to set up the coagulometer yourself! You can go back and watch the video again if that helps.

Now please watch the following video, which will show you how to test your INR.

*(->* [***http://www.youtube.com/watch?v=0KPD8kM1k\_w***](http://www.youtube.com/watch?v=0KPD8kM1k_w)***)***

**DEMONSTRATE YOUR SKILL**

Now try to test your own INR! You can go back and watch the video again if that helps.

**5.2 Using INRatio® 2**

If you are using an **INRatio® 2** coagulometer please watch the following video which will show you how to set it up and how to test your INR.

*(- >* [*http://www.youtube.com/watch?v=wyWe9Je9Cfw*](http://www.youtube.com/watch?v=wyWe9Je9Cfw)*)*

**DEMONSTRATE YOUR SKILL**

Now try to set up the coagulometer and test your own INR! You can go back and watch the video again if that helps

If you would like to see some ‘top tips’ for fingerprick-testing in a step-by-step approach, please click here *(to extra content -> ‘top tips’]*

**6. How do I get a good fingerprick sample?**

You should always wash your hands in warm water and dry them thoroughly before testing your INR. It can be more difficult to get a good fingerprick sample if it is cold outside. Washing your hands in warm water may help, and some people place their fingers in their armpit to warm them up.

Allowing your hand to dangle before lancing can help you get a good blood sample. Also, gently massaging the finger before and after lancing can help.

Never squeeze your finger when trying to get a blood sample! This can result in a false INR reading.

Some people are less comfortable with testing their INR than others, and it can take them a little time to ‘get the hang of it’. Whilst this can be frustrating it is not uncommon and most people quickly overcome these difficulties.

If you would like to know a little bit more about the initial difficulties people have had when testing their INR please click here *[ to extra content -> ‘experiences’]*

**7. Are there any medical conditions that can cause a false INR reading?**

A few medical conditions may interfere with the fingerprick INR test, resulting in an incorrect reading. These include cancer, iron deficiency anaemia and if you have been diagnosed as having anti-phospholipid syndrome or antibodies. If you have any of these conditions you should discuss with your anticoagulation practitioner whether fingerprick INR testing is appropriate for you.

**8. How can I be sure that my coagulometer is giving correct readings?**

It is essential that your machine gives you the correct result on which to base your dose of warfarin. The process of making sure that your machine is measuring your INR accurately is called quality assurance (QA).

Both of the approved machines on the UK market - CoaguChek® XS and INRatio® 2 – have ‘on- board’ QA. This means that each time you do an INR test the machine automatically runs its own quality assurance test. If this test fails, the machine will display an error message.

However, at regular intervals it is good practice to compare the INR result you get from your coagulometer against a ‘known value’. There are a few different ways to do this, but one way is to bring your machine to the anticoagulation clinic. At this visit the clinic staff will compare the INR results from a fingerprick sample on your machine with a known value. They can use one of two known values:

1. The INR result from a fingerprick sample measured on the clinic’s NPT machine, or,
2. The INR result from a blood sample from your arm measured on the laboratory’s machine.

This visit will also give you an opportunity to discuss any issues with your anticoagulation practitioner.

There may be differences between the INR measured from a fingerprick sample on your coagulometer and the INR measured from a sample from your arm measured in the laboratory. This is because the machines use different methods of detecting how blood clots. Small differences are thought to be acceptable.

**9. How do I look after my coagulometer and testing strips?**

Please refer to the manual supplied with your machine for care advice. The testing strips for both CoaguChek® XS and INRatio® 2 can be stored at room temperature for 12 months. Please check that the remaining shelf life on strips that you collect from your community pharmacist is sufficient for your needs. Both coagulometers automatically prevent the use of out of date strips

**10. What should I do if something goes wrong with my machine?**

If fingerprick testing is done in the incorrect way, or if there is a technical problem with the machine, an error message will be displayed. It is important to know what to do if this happens.

The following sources of information are available:

1. The user manual you received with your machine. This may tell you the reason for the error message.
2. The helpline for the coagulometer manufacturer (contact details available from your product literature or from the manufacturer’s website above)
3. The healthcare professional who oversees your anticoagulation

You may have signed an agreement with your healthcare professional when you started self-testing which may give you more precise information on the correct course of action.

**11.** **How should I dispose of waste?**

It is important that you dispose of any blood lancets, strips and cotton wool safely. You should never dispose of them in your household waste. You should put used items in a sharps bin. Your GP may be able to prescribe a sharps bin for you.

Arrangements for disposal of full sharps bins vary from area to area.

When your sharps bin is full, you may be able to return it to your GP surgery, local pharmacy or your anticoagulant clinic.

For further advice on disposal of waste please speak to your anticoagulant clinic or visit the NHS Choices Website ( *-> http://www.nhs.uk/chq/Pages/2421.aspx*)

**DEMONSTRATE YOUR SKILL**

As you have been working through this topic, you should have had the opportunity to set up your coagulometer and test your INR. Your healthcare professional will arrange to take a look at how you are getting on with this.

**DEMONSTRATE YOUR UNDERSTANDING**

Finally, please try to answer the questions at the start of this topic again