**Linda Turner**

**Community Based Point of Care Testing**

**Introduction**

My background is I'm a biomedical scientist and I've worked in pathology for over 40 years, mainly in haematology, blood transfusion and biochemistry, although I have worked in histology very briefly in the early days. My job is to make sure that any pathology testing that is done outside of the laboratory by the patient's bedside or in the clinical areas is done to the same standards as if it was done in the laboratory and giving accurate results as if the test was done in the laboratory to make sure that we're running a safe and efficient effective service.

**Description of the service**

The service I'm going to talk about is setting up the INR testing service within primary care. The service is based on Warfarin is a drug that is very effective in preventing thrombosis and it's very important to use on patients who have had previous thrombosis, like deep vein thrombosis or pulmonary embolism, but it's also very effective at preventing thrombosis from occurring. It can be used as a prophylaxis for atrial fibrillation and it's also used in patients who have had mitral valve replacements because they have a tendency to clot unless they are given some anticoagulant. But Warfarin itself is quite an unstable drug in the sense that it needs to be monitored and it needs to, the dose of how much Warfarin you take needs to be monitored closely because even things like foods that you eat can affect the efficacy of the drug. They measure what's called the INR, which is the internationalised ratio, to monitor and dose patients on how much Warfarin they need to take. In doing that, they can make sure that the patient is taking enough to prevent thrombosis but not taking too much that will actually cause haemorrhage and that's the important thing and why it needs to be monitored regularly.

**Why the service was needed**

Previously, this monitoring would have been done in the laboratory and patients would have a blood test taken either in the GP surgery or within a clinic. The sample would be sent to the hospital laboratory where it would be tested. The result would then be available to the GP surgery if they were dosing or the anticoagulant service if they were dosing and they would then dose the patient. They would then either phone the patient or send the result out in the post to tell the patient what they needed to take and for how long a period they needed to take that dose and when they needed to come back into either the surgery or the clinic to have a repeat test done.

The problem with that is by the time they get the result back, it's either later on that day or even the following morning as the samples have to be transported to the laboratory, the test has to be run and then obviously it needs to be authorised and sent out. What you can find is that if you have a patient whose INR is either too high and the patient has a risk of haemorrhage or it's too low in which case there is a risk of thrombosis, then very often by the time that result comes out, it's very much later in the day and very often either GP out of hours has to get involved or the patient has to attend the emergency services in order to have treatment to prevent either haemorrhaging or prevent thrombosis.

Now with this project which is actually to have the test done by a small machine and done in the GP surgery or in the anticoagulant clinic with a finger prick sample so the patient is there and the test takes literally a minute to perform and they have their INR result there and then. They can then discuss that result with the patient, ask if they had any changes in diet, are they on antibiotics, is there any reason why your INR has changed and they themselves or the GP surgery or the anticoagulant clinic would be able to give that patient treatment there and then to help prevent the risk of haemorrhaging or thrombosis which means the patient doesn't end up coming into the emergency services. But it also gives that opportunity for the patient themselves to discuss their treatment, to discuss their plan with the healthcare professional who is actually looking after their condition and looking after their warfarin.

The project was to encourage the GP surgeries to actually take on board the testing and to actually run the testing within the GP surgeries and it was a very much a collaborative approach. Obviously it wasn't just a point of care testing team, we had the anticoagulation clinic team involved with that and obviously the GP surgeries, the GPs themselves but also the healthcare professionals, the practice nurses, the practice managers were involved in that process in setting up the service as well. That's why it was done, it was to improve patient care.

**Benefits to patients and the wider system**

In the first year we saw a 26% reduction in patients hitting the acute services because of high out of range INR results and needing treatment. The conversation can be had with the patient and the person that's dosing the patient. It's been much easier for them to keep the patient within their therapeutic range so they're not jumping out of range as often because of having those conversations. Even when there's a change in temperature it can affect the efficacy of the warfarin and affect the INR result. Being able to discuss that with the patient, "Oh I'm going on holiday." "Oh well perhaps maybe we'll look at just tweaking your dose down a little bit so that you don't then suffer with high levels whilst you're on holiday." Those conversations have actually meant that more patients are within their percentage time in therapeutic range as a result of that.

We did a survey from the patients after the first year, and over 90% of the patients much preferred this new way of doing it in having the finger prick and also it's less invasive. It's a small finger prick as opposed to a needle and having to take a large quantity of blood as well. It's had a good impact there. It's also had an impact on the service, in taking a blood sample that needs to be sent to the laboratory, it has to be a full blood sample. It has to be exactly 4.5 mls in that bottle or else the sample is insufficient and very often you've got elderly people who don't have particularly good veins who are having their blood done and very often when the sample does hit the laboratory, it's insufficient. The patient has to be recalled and then has to have another blood test but because this is a finger prick and it is just eight microlitres of blood it's far more likely that you will be successful in getting the blood that you need and also because you're doing the testing there and then and you're getting the result there and then, you know that you've taken a good sample while the patient is still there. If you haven't taken a good sample, you can repeat it there and then without having to recall the patient a few days later and having to book another appointment for them to come in and have a repeat phlebotomy test done in which you may not be successful a second time.

It is far better system for both the patient and the healthcare providers who are able to be 100% sure that they getting that result there and then rather than, you know waiting for the lab to get back to them to say whether or not it's been successful. And I think everybody is far happier with the service. I think the main thing that is really important in developing this service is obviously the result is only as good as a person that is actually performing the test. The important thing is was making sure that everybody had sufficient training on using the devices to be able to guarantee that they were getting an accurate result and that they had the confidence that they could rely that that result was accurate.

One thing we also did was we run a system where once a month the healthcare providers have to on one patient, they do the finger prick, they get the INR result but they have to take a venous sample and send a sample into the laboratory for comparison. And that then allows us to compare once a month with every surgery, every district nurse practice that the result that they got on the device is the same as a result that they would get in the laboratory. And with running that, what we did find is that with the actual healthcare providers and also the laboratory could see how close the comparisons were and it gave them confidence that they were running a safe service and that they were getting accurate results. Setting that up was really helpful because one of the key things we did have was that in giving confidence to the healthcare providers that their results were as accurate as if they'd sent a sample to the lab. Setting comparisons up was key into giving them that confidence. But training was a big thing is to delivering the training and I think we initially we set up training sessions across the health board in order to try and if you think the health board itself is quite large up to Blaenau Gwent, Newport, across to Monmouthshire. We had to set up training sessions in locations that would be suitable for the staff to come from those surgeries and for the district nurse bases to come to us to have that training and that was quite a challenge actually in setting up enough locations to make it convenient for them to attend.

**Digital innovation**

The system that we have is really good because we have what's called connectivity to IT systems, we were able to set up that anybody that uses the devices has to be trained and then they're issued with a barcode which gives them access to the machine and you can't get into the machine to run a patient test without having a barcode. You don't get the barcode unless you've done the training. We have that safety that only people who have been trained to use the devices can actually physically access the device to use it to run patient tests because that the training is absolutely key.

One of the other lessons that we found from this was that because previously, the tests were done in the laboratory, the INR results would then be available on the laboratory information system which would then be available on the clinical systems on the unit so those INR results could be visible to clinicians within both primary care and secondary care through those IT systems. With introducing the testing at the patient's bedside, the problem was that those INR results were not getting into the patient's electronic record and the problem with that is particularly in secondary care, if the patients did come into secondary care, all of a sudden they wouldn't see any INR results and there would be the thinking that possibly the patient was no longer on warfarin whereas they were still actually on warfarin.

We did have to engage with lots of IT people in order to get the system up and running and be able to get these devices into the network system and then down into our IT systems so that they could work that way. That was the second part of the project which we have now successfully completed literally within the last few weeks but it needs some tweaking. There's still some issues with it but we're still working with the IT companies to have it working smoother than it currently is, but at the moment we do have it now that all the INR results from the point of care devices are now coming into our IT system which makes them available in the patient's electronic records both in primary and secondary care. Aneurin Bevan Health Board is the first in Wales to have achieved the connectivity of the devices into the IT systems within secondary care and primary care and we were the pilot for that and that is something that other health boards will be looking to take forward in the future.

Having learned the lessons that we've learned on connecting the devices, I recently did a presentation to the all-Wales point of care, giving the lessons learned from that system so we are the first in Wales to have achieved that. I do think this is a great service, I think it is much better for the patient and I think it is much better for the healthcare providers and I think by showing the fact that it is far safer and if the patient does need additional treatment to prevent haemorrhaging or thrombosis it can be dealt with much quicker and therefore the impact would be far less and I think it's just a fabulous far better way of managing patients on warfarin.