



Patient safety awareness week

Improving the patient experience: starting the journey

In this article, Dr Gareth McKeeman explains how his role in producing resources for Patient Safety Awareness Week 2020 developed into a wider-reaching project to improve communication between patients and pathologists and the experience of patients. Dr McKeeman highlights how patient experience is integral to patient safety.

Highlighting the role of pathology laboratory services

For me, the most positive experience to come out of 2020 was the start of a journey of direct patient engagement, initially instigated by the Royal College of Pathologists' Patient Safety Week that was launched in March 2020. At the beginning of 2020, in those pre-pandemic times, myself and other members of the Royal College of Pathologists' Northern Ireland Regional Council were tasked with developing a podcast. It was to include a patient who was willing to be interviewed and talk about their experience and knowledge of the laboratory teams involved in their care. Our initial aim was to highlight the important role that laboratories, and the diversely skilled laboratory staff, play in the patient journey. We wanted to improve transparency of what happens across laboratory services and increase the visibility of the laboratory to patients.

A patient from within our Trust was invited to visit our Blood Sciences labs (Biochemistry and Haematology) to follow their blood samples from collection at the clinic through to the reporting of the test results. During this visit different laboratory staff (medical laboratory assistants, biomedical scientists and clinical scientists) explained their involvement in the sample pathway process and answered questions. I was invited by the patient to accompany them to their next clinical appointment and to follow their weekly journey through the cancer clinic. Our conversation about this journey was recorded as a podcast, which was launched during Patient Safety Awareness Week 2020.

Understanding the effect of test results on patients

Through this interaction with the patient and the development of the podcast, my colleagues from the regional council and I began to develop a much deeper understanding and appreciation of the many challenges, fears and anxieties that exist among patients when waiting on blood test results. In particular, when patients are waiting in the cancer clinic knowing the reported results may affect their treatment. With this in mind, we believed there was one area that laboratory teams could improve on – better patient information.

It was clear that the initial aim of our work had to change. We needed to increase patients' understanding of why we do the things we do in clinical laboratories. It was important to explain that many of the processes that occur and the factors that influence what results are reported are not linked to the immediate health of any individual patient. For example, one of the threads picked up from our conversation with our patient was that small deviations from the perceived 'normal' weekly set of test results (such as a haemolysed sample that leads to no result being reported, a delay in results due to lab pressures/analyser downtime or small changes in the actual test result from the previous sample) can have a significant negative affect on the patient due to increased anxiety and worry.



One of these areas – the issue with haemolysed samples for clinical biochemistry testing – was raised during the podcast conversation. It was interesting, yet worrying, to note that it is never explained to some patients that this issue is most commonly caused by problems with the sample collection method or transport to the laboratory rather than it being associated with any decline in their condition. The patient we met had assumed that a result not being reported because of haemolysis was a sign of a decline in their stage of disease.

The same patient explained how perceived delays in the turnaround of results (i.e. when they took longer than the usual one to two hours) caused anxiety, with the assumption that the delay indicated abnormal or less favourable results. Small rises in the reported values for a test, such as for a tumour marker, also caused the patient concern as there wasn't sufficient explanation about the natural causes of result variations and the measurement uncertainty associated with any type of numerical test results. This may not seem like overly significant information to those based in clinical diagnostic laboratories, but it was evident from this conversation that we could provide better context around laboratory results and start to break down some of these barriers.

Improving patient information

Myself and laboratory representatives from the other disciplines involved in cancer diagnostics (Haematology, Histopathology and Genetics) within our Trust established a working group to improve the information provided to patients and the link between patients and the pathologists. Progress with this has been slower than anticipated because of pandemic pressures. However, we were able to link up with the local Cancer Services Involvement Group to secure volunteers from the Patient and Public Involvement (PPI) group who were willing to provide feedback and ideas on the laboratory testing information they would find useful. We met with these seven volunteers through virtual meetings.

Over the course of the meetings our team of pathologists and patient volunteers produced posters and information sheets to be displayed in cancer clinics associated with the Regional Cancer Centre at the Belfast City Hospital. Examples of the information sheets provided for Haematology, Cellular pathology and Clinical Biochemistry disciplines are shown at the end of the article.

Displaying patient information

One of the main areas of discussion was how best to disseminate information around laboratory testing to the wider group of patients that attend clinics regularly. A mixed media approach was needed as people absorb information in different ways and varying time frames. It was decided that information would be displayed using posters pinned to notice boards in outpatient clinical areas and TV screens would also be used so the information could be displayed in a different format (e.g. Powerpoint slides on a timer).

A webpage with further detailed information around laboratory testing for this patient group is also being developed, which we hope will include short videos produced by local laboratories and their staff. Interestingly, some of the patients were very keen to know more about the various staff

working in the laboratory and the actual people who may be dealing with their samples each week. A 'jargon buster' pack or information pack offered to those attending the clinic for the first time for treatment was also suggested. These packs would explain medical procedures and the journey of blood samples using easy to digest language, making this information far more accessible.



Promoting communication between patients and pathologists

We see this work as a good opportunity to promote pathology and pathology careers to the wider public as well as emphasising the importance of laboratory diagnostics for safe and effective patient care. Links to Lab Tests Online and the public engagement videos hosted on the Royal College of Pathologists' website could be included to provide further insight, and hopefully reduce some of the fears that exist around laboratory tests and processes.

I believe there are many directions that we could take this work with different patient groups. However, support is needed for the work to continue. There is an opportunity for increased laboratory representation at PPI groups or new groups set up to improve liaison between the different pathology disciplines and their patients. Moreover, staff could be employed by pathology laboratories or laboratory networks, to assist in the development of patient information, oversee information channels and to facilitate feedback to and from patients.

Integrating patient experience into patient safety

When it comes to patient safety, there is much more to this than oversight of the internal laboratory processes around sample analysis and producing results. Patient safety is also linked to patient experience. It's about making the patient feel they've had a positive and effective experience – increasing their awareness of what goes on in our pathology laboratories is part of that. Many patients are not aware of the role the hospital laboratory service plays in their diagnostic journey and there are opportunities for us to provide better information to particular groups of patients. The aim being to improve transparency and understanding of the processes surrounding sample collection and result reporting, perhaps including the timelines involved. When service users feel calm and content with laboratory testing, we are enhancing patient safety.



A senior biomedical scientist explains the quality control process and steps required before samples can start to be analysed, and why delays can occur to the start time on some occasions.

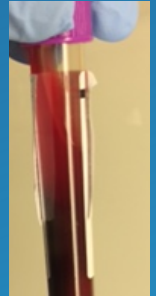
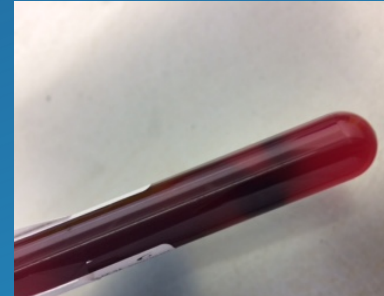
Collaboration is key

I would like to acknowledge the laboratory scientists and medical staff who helped start this important work and those who continue to be involved. These include Dr Melanie Percy (Principle Clinical Scientist, Haematology), Dr Shirley Heggarty (Consultant Clinical Scientist, Medical Genetics), Dr Clinton Boyd (Consultant Histopathologist) and Dr Amy Wotherspoon (Senior Clinical Scientist). Most importantly, I would like to thank all the patients who have contributed so far. Their input and enthusiasm to date has been invaluable.

What we do in Haematology

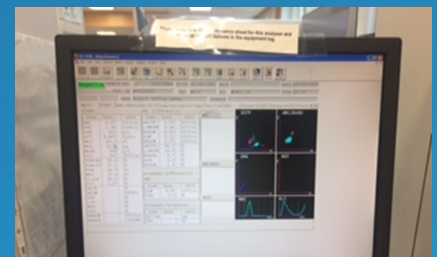
Haematology is one of many different departments within the laboratory that performs analysis on the different blood cells found in the circulation

Haematology tests are conducted on whole blood - which means the sample does not need any special processing (such as separating the cells from the plasma - like in Biochemistry).



These are some of the tests performed in Haematology that are measured in patients undergoing cancer treatment

Parameter	Reference range		Reason for testing
	Males	Females	
Haemoglobin	130 - 180 g/l	115 - 165 g/l	To check for anaemia or malignancy
Haematocrit	0.4 - 0.54 %	0.37 - 0.47 %	
Leucocytes	4 - 10 $10^9/l$	4 - 10 $10^9/l$	To assess number of white cells & the immune response
Platelets	150 - 450 $10^9/l$	150 - 450 $10^9/l$	To assess if at risk of bleeding (low) or if neoplasm (high)
Red Blood Cells	4.5 - 6.2 $10^{12}/l$	3.8 - 5.8 $10^{12}/l$	To check for anaemia or malignancy
Mean Cell Volume	76 - 100 f/l	76 - 100 f/l	To assess if anaemia
Cell Haemoglobin Concentration	320 - 360 g/l	320 - 360 g/l	To assess if anaemia or iron deficiency
Mean Cell Haemoglobin	27 - 32 pg	27 - 32 pg	
Neutrophils	2 - 7.5 $10^9/l$	2 - 7.5 $10^9/l$	To assess the immune response Raised in infections
Lymphocytes	1 - 3.5 $10^9/l$	1 - 3.5 $10^9/l$	To assess the antibody response



Samples for haematology analysis are transferred to the appropriate lab section and loaded onto the automated analysers. Analyser will perform automatic checks for sample problems such as low volume and clot interferences

Samples will automatically be moved along the track and different parameters can be measured at each station. Once results generated are reviewed and checked by the lab team these are released so your doctor or nurse can look them up on the lab IT system

Lots of different staff work in the laboratory that may handle your sample, including:

- Medical laboratory assistants
- Biomedical Scientists
- Clinical Scientists/ Medical doctors (Haematologists)



For more information on tests performed in

Haematology lab, visit: <https://labtestsonline.org.uk/>

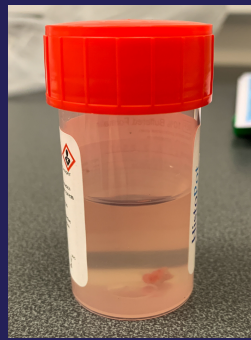
Your biopsy's journey through the lab

And the staff that make it possible...

1 Your biopsy arrives in its container and the details are checked

Laboratory assistant

Clerical officer



2 A wax block is produced with the biopsy tissue inside.

Biomedical scientist

Laboratory assistant



This one has been painted green so it is easier for the lab scientists to see!

3 Very thin slices of tissue are cut from the wax block

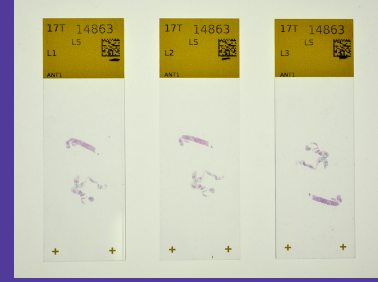
Biomedical scientist



4 The slices are put on glass slides and dyed

Biomedical scientist

Laboratory assistant



5 A pathologist looks at the slides under a microscope

Doctor



This is a benign breast lump called a papilloma

6 The pathologist writes a report to tell your doctor what they have found

Sometimes your tissue needs extra tests before the report is written - this can make things take a bit longer.

Doctor

Clerical officer

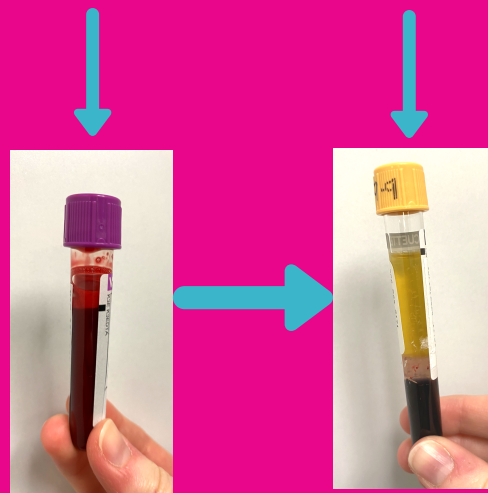
What we do in Biochemistry

Biochemistry is one of many different departments within the laboratory that performs a large range of tests

These are some of the tests performed in Biochemistry for breast and prostate cancer

Test name	Reasons for testing	Reference ranges
Urea & Electrolytes (e.g. Sodium, potassium)	To check how well your kidneys are working and electrolyte balance	Sodium: 136-145 mmol/L Potassium: 3.5-5.3 mmol/L Bicarbonate: 22-29 mmol/L Urea: 2.5-7.8 mmol/L Creatinine: ♂ 59-104 umol/L ♀ 45-84 umol/L
Liver Function tests	To check how well your liver is working. It is involved in the breakdown of some chemotherapy drugs	AST: ♂ <40 U/L ♀ <32 U/L ALT: ♂ <41 U/L ♀ <33U/L GGT: ♂ 10-71 U/L ♀ 6-42 U/L
Magnesium	Some cancer treatments can cause this to fall. It is involved in lots of different reactions in the body so important levels are adequate	0.7-1.0 mmol/L
LDH	Can be used to monitor how well your treatment is working	♂ 135-225 U/L ♀ 135-214 U/L
Glucose	Steroids can be used in some treatment - this can effect your glucose levels	Random: 4.0-8.0 mmol/L Fasting: 4.0-6.0 mmol/L
Bone profile	Some treatments can weaken bones. These are used to monitor your bone health	Adj. calcium: 2.2-2.6 mmol/L Phosphate: 0.8-1.5 mmol/L ALP: 30-130 U/L
PSA	Used to detect prostate cancer and also monitor if treatment is working	<49 yrs: 0 - 2.5 ng/mL 49-59 yrs: 0 - 3.5 ng/mL 60-69 yrs: 0 - 4.5 ng/mL 70-79 yrs: 0 - 6.5 ng/mL 80+ yrs: 0 - 7.5 ng/mL

Biochemistry test results can take longer to come back than others as we need the serum part of your blood. This means we have to 'spin' your sample to separate the serum from the rest



Sample prior to being 'spun'

Sample with serum (yellow part) separated after being spun



It's not you, it's us!

Remember: a delayed result does not mean you need to worry! On some days, delays will happen. These can be caused by quality check failures, meaning samples may have to be retested before results are released, or due to analyser maintenance or breakdown, which may mean samples have to be sent to another analyser within the laboratory

We also check for things that could interfere with your results...



This sample shows the serum is red rather than yellow. This is caused by haemolysis, which occurs when components leak out of the blood cells. Haemolysis is caused by errors in how your sample is collected or stored. It does not mean you are getting sicker! We may not report results if haemolysis is too high, therefore causing your results to be wrong.

Result variation

Your results will vary over time for many normal reasons. This is known as measurement uncertainty and is due to different analysers and reagents being used for testing at different times. We review such variations regularly to make sure they are not beyond set limits

Lots of different staff work in the laboratory that may handle your sample, including:

- Medical laboratory assistants
- Biomedical Scientists
- Clinical Scientists/Chemical Pathologists



For more information on tests performed in Biochemistry, visit: <https://labtestsonline.org.uk/>