Gwasanaeth Gwaed Cymru
Welsh Blood Service

Research Development & Innovation Report

May 2023

Foreword

It is great to welcome you back to our latest update. We have demonstrated that we keep the most critical stakeholders - you, donors, and patients, up to date with discoveries made at the Welsh Blood Service.

We have found that this update is essential for research funding bids because we can demonstrate that we keep you informed of the service's achievements. We are glad to include you in our recent funding application to the Welsh Government.

Here's a quick run-down of some of these new developments:

We proudly congratulate our clinical scientists, Felicity May and Chloë George, on their achievements. Felicity has recently completed her doctorate studies by developing a method to predict whether people with kidney failure will respond well to treatment.

Chloë has won Health Scientist of the Year, in part, due to research into blood transfusions.

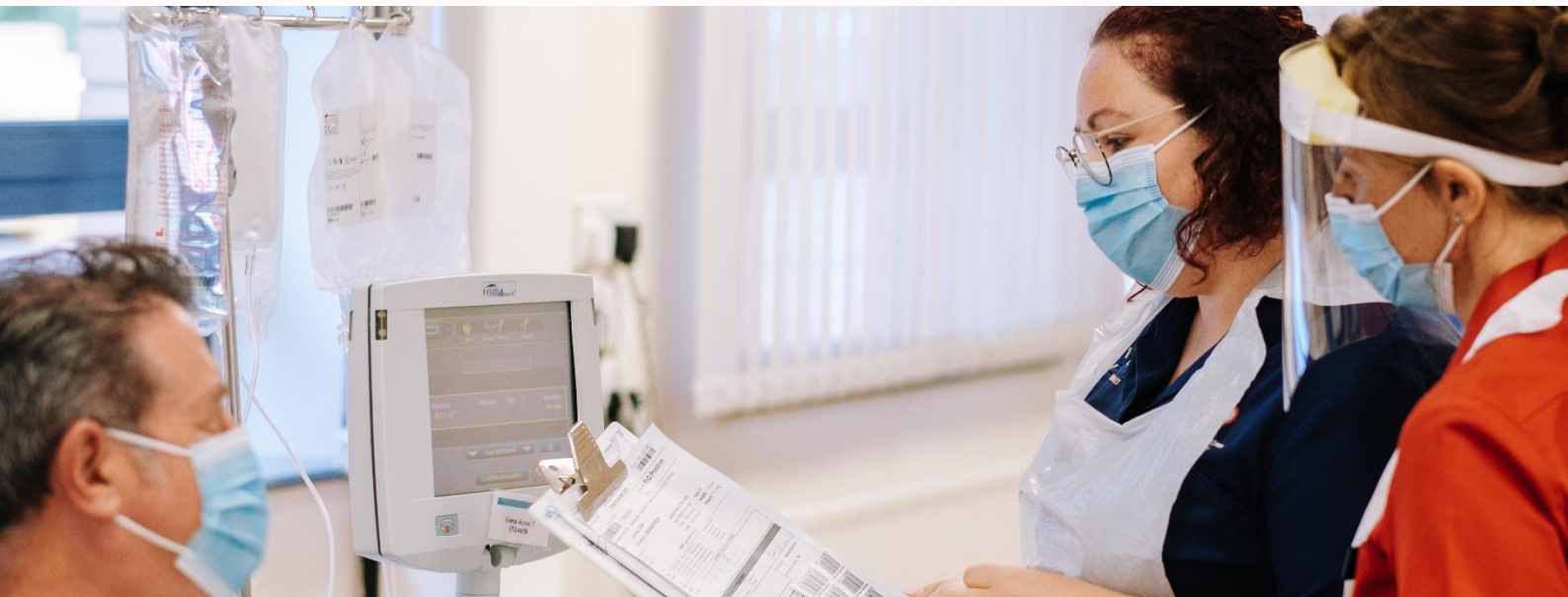
Both have made a real impact on patients by supporting the treatment of challenging medical conditions

Siân James
RD&I Facilitation Lead
Welsh Blood Service

About this document

This document has an up-to-date summary of all planned, ongoing, or completed research, development and innovation activity within the Welsh Blood Service.

This version of the document has been specially adapted so the donors, patients and the public can see the Research, Development and Innovation activity they support through the gift of blood, stem cell and organ donation.



Advancing Kidney Transplant Treatments

Felicity May is a Clinical Scientist who specialises in histocompatibility and immunogenetics. Felicity started working at the Welsh Blood Service in 2007.

Felicity completed her doctorate research project, investigating the response to desensitisation treatment in patients awaiting a kidney transplant. After undertaking her first investigator-led research project, Felicity has become a Doctor of Clinical Science.

Felicity conducted her research with academic support from the University of Manchester and in collaboration with the Nephrology and Transplant Department in University Hospital of Wales, Cardiff.

Felicity May

picking up patient samples from University Hospital of Wales

Here we explain the importance of this research and how it can help patients with kidney disease.

Improving transplantation outcomes

On average, a patient waits over two years for a kidney transplant. There is a far greater demand for kidney transplants than available organ donors. Not every organ is safe for every patient. When a kidney becomes available for transplantation, many clinical and laboratory factors determine which patient receives the donated kidney.

Felicity investigated the immune system of kidney transplant patients to help address a significant inequity issue.

A barrier to successful transplantation

The immune system makes molecules called antibodies to help fight off illness. However, antibodies cause problems for potential transplant recipients because they can lead to the rejection of transplanted organs.

A proportion of patients on the transplant waiting list have high levels of antibodies. High antibody levels reduce the likelihood of successful transplantation.

Patients with high antibody levels wait longer for a compatible organ or may never be eligible for a kidney transplant.

What can be done?

Treatments are available to reduce antibody levels in patients awaiting a kidney transplant. The treatment is known as *desensitisation* and allows patients to be successfully transplanted with otherwise 'incompatible' organs.

Desensitisation describes a range of treatments used to remove antibodies from donor patients. Some treatments target the cells that generate antibodies, and some target the antibodies themselves. However, desensitisation is not an effective treatment for all patients.

The response to desensitisation treatment can vary. The treatment works effectively in some patients, but other patients do not respond as hoped.

Giving patients desensitisation treatment exposes them to unnecessary side effects if the treatment does not work. Due to this knowledge gap, clinicians cannot predict whether a transplant patient will respond to desensitisation treatment.

Felicity's Research Project

Felicity designed and conducted a research project to address this knowledge gap.

Felicity investigated twenty-seven transplant patients who underwent desensitisation treatment before transplantation. The research examined serum samples collected from patients at different time points before and after treatment. It is not possible to predict patient response to desensitisation treatment using antibodies alone. Therefore, Felicity looked at levels of cell signalling molecules, which have rarely been studied in transplant patients.

Felicity discovered some unintended effects of desensitisation treatment. In some patients, the treatment increased cell signalling for antibody production! This is a surprising discovery that needs further exploration.

Felicity's project is a step towards understanding why some transplant patients do not respond to desensitisation treatment. Felicity's research will aid further studies which hope to minimise unnecessary treatment for kidney transplant patients and inform alternative treatments.

Testing in the Welsh Transplantation & Immunogenetics Laboratory

Success at the 2022 Advancing Healthcare Awards Cymru

In November 2022, the Cymru Advancing Healthcare Awards took place in Cardiff. The awards highlight the dedication, hard work and innovation among Allied Health Professionals and Healthcare Scientists in Wales.

The Healthcare Scientist of the Year award recognises healthcare scientists who have engaged beyond the boundaries of their service to demonstrate the broader contribution healthcare scientists can make to the NHS.

We are delighted to announce that the **Healthcare Scientist of the Year 2022** was awarded to:

Chloë George

Chloë is Welsh Blood Services' Head of Component Development and a leading transfusion scientist. Chloë impressed the judges with her ground-breaking work in the cold storage of platelets, for longer shelf life and safer transfusions.

Chloë has also been recognised for establishing the Component Development & Research Laboratory.

What are Cold Stored Platelets?

The demand for platelets has increased over recent years. Platelets are stored at room temperature and have a short shelf life of around a week.

However, a growing body of research is now finding that we can store platelets at lower temperatures, and these "cold-stored" platelets may have benefits over the room-temperature platelets. Chloë's work has been published in the journal *Platelets,* and will improve the quality, safety and efficiency of platelet storage for patients.

Chloë has plans to lead a clinical trial in the future and is researching different environments and their effect on platelet characteristics.

Her team in our Component Development Research Laboratory are involved in several ongoing projects focusing on new and better ways to produce, store, monitor and use blood components for transfusion.

RD&I Project Portfolio

We have 15 open projects

Projects by Theme

Transplantation

Includes solid organ and stem cell transplantation, histocompatibility, immunogenetics and donor registries

1

Products

Includes blood components, immunohematology, testing, component and product manufacturing, quality management, and the evaluation of equipment and materials

8

Donor

Includes donor recruitment and retention, eligibility and care and public health surveillance

5

Cellular Therapies

Includes topics surrounding cellular and other blood therapies

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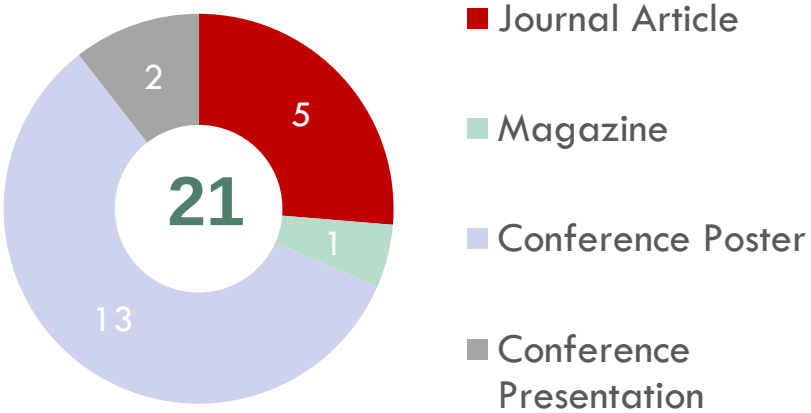
Publications

in last 8 months

We publish in journals and present at conferences to share findings and build our reputation in the research community. Producing publications also provides our staff with opportunities to develop their skills and build professional reputations.



Publications

Impactful publications from the Welsh Blood Service colleagues and our collaborators in the previous eight months.

Journal Articles

pH is unsuitable as a quality control marker in platelet concentrates stored in platelet additive solutions

Jamie Nash, Christine Saunders & Chloë George *in the journal* **Vox Sanguinis**

Citation: Nash J, Saunders CV, George C (2023) "pH is unsuitable as a quality control marker in platelet concentrates stored in platelet additive solutions," Vox Sanguinis, 118(3), pp. 183–184.

Recommendations for in vitro evaluation of blood components collected, prepared, and stored in non-DEHP medical devices

Chloë George *in the journal* **Vox Sanguinis**

Citation: Klei TRL, Begue S, Lotens A, Sigurjónsson ÓE, Wiltshire MD, George C, van den Burg PJM, Evans R, Larsson L, Thomas S, Najdovski T, Handke W, Eronen J, Mallas B, de Korte D. (2023) "Recommendations for in vitro evaluation of blood components collected, prepared and stored in non-DEHP medical devices" Vox Sanguinis. 2023 Feb;118(2):165-177.

Cold stored platelets in the management of bleeding: is it about bioenergetics?

Chloë George & Christine Saunders *in the journal* **Platelets**

Citation: George, C.E. et al. (2023) "Cold stored platelets in the management of bleeding: Is it about bioenergetics?," Platelets, 34(1).

Safety profile of plasma for fractionation donated in the United Kingdom, with respect for variant Creutzfeldt-Jakob disease

Janet Birchall *in the journal* **Vox Sanguinis**

Citation: Thomas, S, Roberts, B, Domanović, D, Kramer, K, Klochkov, D, Sivasubramaniyam, S, et al. Safety profile of plasma for fractionation donated in the United Kingdom, with respect to variant Creutzfeldt–Jakob disease. Vox Sang. 2023.

Current transfusion practice and need for new blood products to ensure blood supply for patients with major haemorrhage in Europe

Chloë George *in the journal* **Transfusion**

Citation: Apelseth TO, Doyle B, Evans R, George C, Humbrecht C, Klei T, Najdovski T, Sigurjónsson ÓE, Wiltshire M, de Korte D. Current transfusion practice and need for new blood products to ensure blood supply for patients with major hemorrhage in Europe. Transfusion. 2023

Magazine Articles

The Best Preparation for Tomorrow is having the Foresight Today

Michael Cahillane

BBTS Bloodlines Magazine: December 2022 edition

Conference Proceedings

Validation of LAB Screen™ Luminex® kits for the detection and characterisation of HLA IgM antibodies

Katie Whittle

Oral Presentation at the
British Society for Histocompatibility & Immunogenetics Conference 2022

Surrogate listing of unacceptable antigens to avoid predictable positive crossmatch offers

Sandra Lloyd

Oral Presentation at the
British Society for Histocompatibility & Immunogenetics Conference 2022

NEQAS BC launches external quality assessment for light transmission aggregometry (LTA) using cold stored platelet concentrates

Michael Cahillane, Christine Saunders & Chloe George

Poster Presentation at the
European Association for Haemophilia and Allied Disorders 2023

Reporting of HLA-DQA and -DPA Antibodies in UK NEQAS for H&I Scheme 3 – HLA Antibody Specificity Analysis

Amy De'ath, Deborah Pritchard & Tracey Rees

Poster Presentation at the
British Society for Histocompatibility & Immunogenetics Conference 2022

False Negative DQ2 antibody screen

Sarah Dyer, Emma Burrows & Deborah Pritchard

Poster Presentation at the
British Society for Histocompatibility & Immunogenetics Conference 2022

Frequency and implication of HNA antibodies in patients on the kidney transplant waiting list

Kim McShane

Poster Presentation at the
British Society for Histocompatibility & Immunogenetics Conference 2022

HNA-3a Antibodies - Laboratory Assessment and Immunological Risk

Amy De'ath, Deborah Pritchard & Tracey Rees

Poster Presentation at the
British Society for Histocompatibility & Immunogenetics Conference 2022

Comparison of kit use and performance in UK NEQAS for H&I Scheme 3— HLA antibody specificity analysis

Amy De'ath, Geraint Clarke, Deborah Pritchard & Tracey Rees

Poster Presentation at the
European Federation of Immunogenetics Conference 2023

A case of severe thrombocytopenia and fragmentation haemolysis post PBSC harvest

Kalinga Perera, Christopher Harvey & Lynne Jones

Poster Presentation at the
British Blood Transfusion Society Conference

Emergency use of group O red cells in Wales: intervention and outcomes on a national level

Lee Wong

Poster Presentation at the
British Blood Transfusion Society Conference

The Development of a Transfusion Practitioner Competency Framework for Wales

CATEGORY WINNER

Joanne Gregory

Poster Presentation at the
British Blood Transfusion Society Conference

How Males are Positively Supporting the Blood Supply

Lee Wong

Poster Presentation at the
British Blood Transfusion Society Conference

Perioperative Anaemia – achieving a national pathway in Wales

CATEGORY WINNER

Stephanie Ditcham

Poster Presentation at the
British Blood Transfusion Society Conference

Platelet function and viability following cold storage within a medical transport box and an extended 14-day shelf life

Jessica Sayle

Poster Presentation at the
British Blood Transfusion Society Conference

Developing a Collaborative National Blood Transfusion Training Package for Student Nurses in Wales

Joanne Gregory

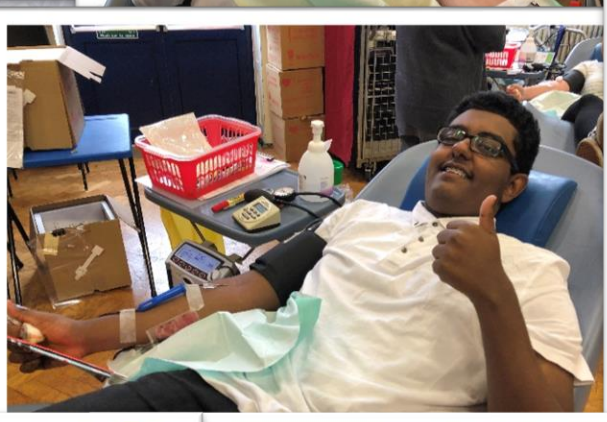
Poster Presentation at the
RCN Education Forum National Conference & Exhibition 2023

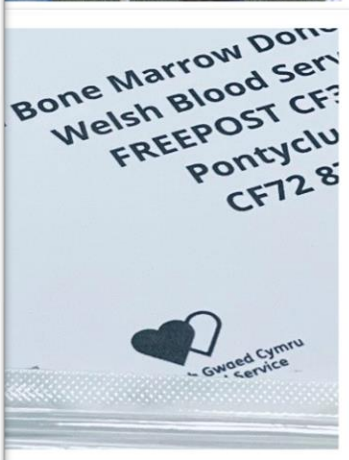
This report is prepared by

Research Development & Innovation Facilitation

Natasha McLaughlin & Sian James

Valid until September 2023





We thank the blood, platelet and transplant donors who make our research possible.

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Welsh Blood Service