

Gwasanaeth Gwaed Cymru Welsh Blood Service

Research Development & Innovation Report

May 2022



Give blood, save lives.

Our Vision

Welsh Blood Service will advance donor care and transfusion and transplantation medicine through the inception and participation in high quality health services research.

Foreword

We begin our planning year in our strongest position yet. The first WBS Research Theme Delivery plan for 2022-23 has been compiled with our theme leads having a dedicated 12 months. Our program includes adding new researchers that will advance our portfolio size. I thank them for their continued support in taking this proactive approach.

In this update, we look back on some of the longest running projects we have. In the coming months, we will celebrate the completion of two PhD studentships that were part of our portfolio for several years. It has been against a challenging backdrop that the students conducted their research with us. We will be celebrating the achievements of Dr Williams and Dr Nash.



Sian 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

Success in our Academic Partnerships

This spring two academic partnerships completed their findings. We catch up on the projects and the students that conducted the research.

Using Advanced Mathematics to Plan Clinics

3

Nobody likes to queue so the Welsh Blood Service set out to understand if our clinical planning could be helped by assistance from Cardiff University.

This project was conducted in partnership with Professor Paul Harper and Professor Daniel Gartner. Both Professor Harper and Professor Gartner's respective research endeavours have led to sustained impact and significant benefits to the NHS previously, making them a great match for supporting this work and student.

The research project used mathematical modelling to propose optimised clinic plans and resource utilisation to maximise flow and efficiency whilst maintaining excellent standards of donor service and ensuring equity of donation opportunities for donors.



Emily Williams has been awarded her doctorate for her healthcare modelling research into the supply and demand of blood products with the aim of developing an automated decision support tool that optimises blood collection clinic selection.

Emily was a doctorate student through a joint Knowledge Economy Skills Scholarship between the Welsh Blood Service and Cardiff Metropolitan University. Her research has been part of our Donor RD&I theme since 2017 and was supervised by our interim Blood Supply Chain lead, Jayne Davey.

Emily's research aimed to improve alignment of blood product supply to demand, thus reducing waste and ensuring sufficient amounts of the right blood products are available for patient needs.

Dr Emily Williams



The current process for selecting available and productive whole blood donation clinics for the collection plan is entirely manual and is labour intensive. Emily's work uses algorithms to evaluate historical clinic data and produce automated clinic planning options.

Speaking of Emily's healthcare modelling research Jayne Davey said 'I am thrilled Emily has been awarded her doctorate for the research she has carried out at the Welsh Blood Service. Clinic planning in a community setting is complex and has multiple constraints. Emily's logical, curious and innovative approach has allowed her to prove how automation can work in a live setting. It has been a pleasure to work with Emily and her success is well deserved.'

Emily's literature review for this research was published in the journal IISE Transactions on Healthcare Systems Engineering in 2020. Emily also received the 'Best Presentation by an Early Career Researcher' award at the Operational Research Applied to Health Services conference in 2019.

New Ways to Store Platelets

Another Knowledge Economy Skills Scholarship was conducted in partnership with Cardiff Metropolitan University. Professor Philip James supported this project. Professor James has authored 141 research publications to date and his research is driven by clinical impact. Professor James has had a significant impact on the successful outcome of this project.

Jamie's studentship was a mainstay of the Welsh Blood Service's RD&I Products theme, with Jamie's supervisor at WBS being Dr Christine Saunders.

When discussing the successful studentship, Dr Christine Saunders said 'The collaboration between WBS and Cardiff Metropolitan University initiated by the KESS2 programme has been extremely positive. Jamie's work has produced some very interesting results that challenge the established practices of platelet storage. The questions generated have led to the appointment of a second PhD studentship, and the department is looking forward to continuing our partnership with the University'.

The research project investigated a range of new approaches to assess the viability and functionality of platelets in different storage conditions. A particular aspect of Jamie's work looked at extracellular vesicles in platelet components. These small particles shed by platelets may play an important role in transfused platelet units' ability to st



Dr Jamie Nash

important role in transfused platelet units' ability to stop bleeding.

Finding alternatives to our current standard-of-care room temperature storage has the potential to benefit patients requiring transfusion. Cold-stored platelets may have improved haemostasis

5

and less risk of bacterial contamination, resulting in a safer and more effective transfusion for patients in trauma settings.



Following Jamie's presentation of the Scott Murphy Memorial Lecture and the University of Oxford Various elements of Jamie's research have been publicised at conferences and in external publications. Jamie has presented at the BBTS Annual General Meeting in 2019 and most recently at the BEST Collaborative Spring 2022 Meeting, after winning their **prestigious Scott Murphy award.** Jamie has also contributed to the Methods in Molecular Biology book series, co-authoring a section on extracellular vesicles in atherosclerosis research.

This research will be continued through another joint doctorate studentship between WBS and Cardiff Metropolitan University. The ultimate goal of this research is to conduct a clinical trial on cold stored platelets and eventually become the standard of practice for storing platelets across the UK and international blood services.

RD&I Project Portfolio

We have 12 open projects



37

Colleagues currently involved in delivering RD&I

Colleagues can undertake WBS led research or provide service support of others' research. This figure also includes those performing research as part of a qualification.

[®] Publications

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

Journal Articles

Blood donor eligibility criteria for medical conditions: A BEST collaborative study Welsh Blood Service in the journal Vox Sanguinis

Citation: Jacquot, C, Tiberghien, P, van den Hurk, K, Ziman, A, Shaz, B, Apelseth, TO, et al. Blood donor eligibility criteria for medical conditions: A BEST collaborative study. *Vox Sang.* 2022.

Impact of COVID-19 pandemic on global unrelated stem cell donations in 2020—Report from World Marrow Donor Association Christopher Harvey in the journal Bone Marrow Transplantation

Citation: Jöris, M.M., Schmidt, A.H., Bernas, S.N. *et al.* Impact of COVID-19 pandemic on global unrelated stem cell donations in 2020—Report from World Marrow Donor Association. *Bone Marrow Transplant.* 2022.

Conference Proceedings

The understated importance of extracellular vesicles in cold-stored platelet concentratesJamie Nashat the conference63rd Meeting of BEST Collaborative

H&I Laboratory Results and Clinical Interpretation for a Sample with HNA AntibodiesAmy De'athat the conferenceEFI Congress 2022

UK NEQAS for H&I Schemes to Support Platelet Investigations – An Analysis of Errors in HPA Genotyping and HPA Antibody Detection / Specification

Amy De'ath

at the conference

EFI Congress 2022

Valid until August 2022



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

