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NSFUSION

## The Welsh Blood Service – 70 years of continuous change

### G. D. Poole

Welsh Blood Service, Talbot Green, UK

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### SUMMARY

The National Blood Transfusion Service (NBTS) in England and Wales was established as a single entity in 1946 and operated as such for almost half a century. During those 50 years, the blood service in Wales, as in the rest of the UK, saw many technological and operational changes. The automation of donation testing, the introduction of successive layers of microbiological screening, the creation of the Tissue Typing Laboratory (later renamed the Welsh Transplantation and Immunogenetics Laboratory) and the development of information technology brought - over a relatively long period - highly significant improvements to an organisation that had begun life as an Emergency Medical Service. Differing funding and reporting arrangements for the Welsh and English blood services made little difference in practice, but the devolution of government following the 1997 referendum in Wales would have a profound influence. Four years before the Government of Wales Act (1998) was passed through the UK parliament, the National Blood Authority (NBA) assumed executive control of the English blood services but not the blood service in Wales. The Scottish National Blood Transfusion Service and the Northern Ireland Blood Transfusion Service had been created as independent organisations in 1946; thus, the scene was set for diversification between the four independent blood services, each operating in different political environments with different funding streams. The creation of the UK Blood Services Forum and its Joint Professional Advisory Committee in 1999 has, however, ensured consistency in professional matters. The blood transfusion service in Wales, in its new headquarters in Talbot Green, became known as the Welsh Blood Service (WBS), or Gwasanaeth Gwaed Cymru in Welsh, reporting for most of its life to the Velindre NHS Trust, part of NHS Wales.

Considerable changes would impact the WBS in the 21st century. Social changes would mean that the role of recruitment and marketing would become ever more important, although the impact of this was lessened somewhat by a decreasing demand for blood following the Better Blood Transfusion initiatives. The

Correspondence: Geoff Poole, Heron House, West End, Bakers Lane, Llantwit Major, Vale of Glamorgan, CF61 1SW, UK. Tel. GRO-C GRO-C email: geoff.welshblood GRO-C

Medicines and Healthcare Products Regulatory Agency found new powers and impetus after the so-called EU Blood Directive was transposed into British law, and the inspection regime became significantly more onerous, requiring more resources to be put in this area. A strategic review found that some parts of the service required extensive modernisation, such as the information technology system in use and the deployment of staff on the blood collection teams, and these matters were attended to. The review also prompted the Welsh Government to consider the question of blood supply to and blood collection in North Wales, which had been the remit of the Liverpool Centre since the establishment of the NBTS in 1946. The Welsh Government duly announced the creation of an all-Wales Blood Service, and finally, in May 2016, 70 years after its creation, the WBS took over responsibility for blood collection and blood provision in the whole of Wales.

Key words: review, Wales, Welsh Blood Service.

# THE FORMATION OF THE BLOOD TRANSFUSION SERVICE IN WALES, 1945–1948

Percy Oliver has been credited as the first person in the UK to realise that the most efficient way of ensuring that a hospital patient could receive blood of the correct blood group was to call a known volunteer to donate. Whole blood would be taken into a glass bottle containing an anticoagulant and stored at 4 °C until required. During the period 1921-1939, there was a steady shift from arm-to-arm transfusion to the use of stored donated blood, gaining particular prominence during the Spanish Civil War. In 1938, the Ministry of Defence established a committee in London to consider how blood transfusion support would be provided to military hospitals in the event of war. This led to the formation of the Army Blood Transfusion Service and the opening of the Army Blood Supply Depot (ABSD) in Bristol in 1939, the first military transfusion service in the world. Such was the demand at the outbreak of war that the ABSD processed more than 33 000 donations in its first year - six times more than the busiest civilian service prior to the war. The ABSD went on to produce all-dried products, crystalloids and grouping sera, as well as all the equipment for collecting and administering blood. Four civilian blood banks were opened in and around London in 1939, the initial intention being to provide blood for



Fig. 1. The original site of NBTS (Wales).

military and civilian casualties. This 'blood transfusion service' proved so successful that in 1940, a further eight regional centres were opened under the supervision of the Emergency Medical Services. The first site of the National Blood Transfusion Service in Wales was in the Emergency Medical Service Centre at 19 Newport Road, Cardiff (Fig. 1).

At the end of the war, these regional centres were amalgamated under the supervision of the Ministry of Health. The National Blood Transfusion Service (NBTS) was formally established in England and Wales on 26th September, 1946 (Scotland established its own blood transfusion service), initially consisting of eight Regional Blood Transfusion Centres, later expanding to 14. In the same year, legislation in the form of The National Health Service Act led to the establishment of the NHS in 1948, and consequently, the blood transfusion services came under the umbrella of the new NHS.

## LIFE WITHIN THE WELSH HOSPITAL BOARD, 1948–1974

The Welsh Regional Hospital Board (WRHB) was formed as one of the regional hospital boards established in 1948, under the National Health Service Act, to administer hospital and specialist services. The WRHB was responsible to the Welsh Board of Health and was associated with the Welsh National School of Medicine at Cardiff. Given the geographical proximity of the Liverpool blood transfusion centre (which came under the control of the Liverpool Regional Hospital Board) to North Wales, the WRHB had no jurisdiction for the blood transfusion service in this part of Wales. From May 1961, the Welsh Regional Hospital Board usually omitted the word 'Regional', and in 1964, the name was formally changed to the Welsh Hospital Board (WHB).

In 1953, the Prince of Wales orthopaedic hospital moved to a site near Cardiff on Rhydlafar farm, which had been the home of the 81st US General Hospital between 1943 and 1945. The military hospital consisted entirely of Nissen huts (Fig. 2), but most of these were replaced. Shortly after this, in 1956, the National Blood Service (Wales) also moved to Rhydlafar from Newport



Fig. 2. The Rhydlafar site in 1945.

Road; in spite of the less-than-ideal buildings and location, Rhydlafar would be the home of the National Blood Service in Wales for over 40 years. These early years were characterised by the organisational consolidation of the newly formed blood transfusion service rather than procedural changes or technological advances. At the blood donation sessions, haemoglobin levels in donors were checked pre-donation by ear prick, and medical doctors undertook all venepunctures, collecting whole blood in reusable glass bottles through rubber tubing. Acid-citrate dextrose (ACD) was prepared in a stainless steel drum, dispensed into glass bottles manually, capped and sterilised in an autoclave. Basic quality control consisted simply of a visual check and a random measurement of refractive index. A 'bijou' bottle of ACD was attached to the neck of each collection bottle for later use in cross-matching. In the laboratories, blood grouping of donors was undertaken using tiles and tubes, and microbiological screening consisted solely of a syphilis agglutination test.

Given that integrated flexible plastic bag systems had yet to be widely introduced into blood collection protocols, blood component processing was very limited. Whole blood unused by hospitals was returned to the blood transfusion centre when time expired, and plasma was siphoned off under sterile conditions and pooled in Winchester bottles. The pooled plasma was transported to the Lister Institute in Elstree for processing. In 1948, the name of the Elstree facility was changed to the Blood Products Research Unit, and it was changed again in 1954 when the larger Blood Products Laboratory (BPL) was established on the same site.

The early 1970s saw the very beginnings of a tide of change that would sweep through the blood transfusion services. The need for screening for hepatitis had been identified by 1969, when a letter to the *British Medical Journal* appeared (Fitzpatrick & Kennedy, 1969). The question of screening was actively discussed by the NBTS directors, UK health departments and scientific experts between 1969 and 1972. Despite the uncertainties surrounding the relationship between Hepatitis B and the so-called Australia antigen (now known as HBsAg) and concerns about the sensitivity of the test methods available at that time, the risks of delay became increasingly clear, and by the end of 1972, testing in the UK NBTS had become universal. Although not particularly sensitive, immunoelectrophoresis was the technique of choice for testing for the Australia antigen at this time.

Automation in the clinical laboratory was still very much in its infancy, even as late as 1974. The first single channel Technicon AutoAnalyzer was developed in 1963, and by 1967, field trials in Bristol established that a multi-channel analyser using Technicon technology, and known as the BG-15, could be used in a UK blood transfusion centre to provide speed (120 samples per hour) and reliability to large-scale blood grouping. Other blood services in the UK, including NBTS (Wales), introduced a BG-15 around this time as a first step towards efficiency and safety. It would be several years before the automated interpretation of blood grouping test reactions became feasible; in the meantime, BG-15 operators would read out positive and negative agglutination patterns deposited on a moving roll of blotting paper.

Despite the low technological capability of the blood transfusion service by today's standards, the demand for blood transfusion in the UK increased steadily during the period from 1948 to 1974. In 1945, there were approximately 400 000 blood donors in England and Wales (excluding the South-West Region of England, which was administered by the Army), and 394 000 blood donations were given. By 1955, the number of UK blood donors had risen to 550 000. NBTS (Wales) was collecting about 50 000 whole blood donations by 1974.

#### **REPORTING TO THE WELSH OFFICE, 1974–1999**

Although the original NHS structural arrangements were initially adequate, the general opinion was that it created unnecessary boundaries and inhibited the provision of seamless patient care. Professional, public and political opinion moved firmly in favour of creating a fully integrated, single-authority structure locally. Various options were studied in the 1960s, but finally, in 1974, a new integrated structure consisting of regional and area health authorities, with detailed variations, was implemented in England. In Wales, the work of the Welsh Hospital Board was absorbed by the Welsh Office, headed by the Secretary of State for Wales. The blood transfusion centre in Rhydlafar did, however, become known as the Welsh Regional Transfusion Centre. During this period, health and social care policy in Wales closely followed that in England, but it is fair to say that the adoption in Wales of the NHS internal market in the 1990s was not as enthusiastic as it was in England. Nonetheless, the first hospital trust was established in 1991 in Pembrokeshire, and this was followed by the formation of a further 30 trusts. In 1998, the five ambulance trusts were amalgamated, and by the end of 1999, only 16 hospital trusts were in existence. However, the relationship between the English and Welsh health services would change fundamentally following the 1997 referendum when the Welsh people were asked whether 'there should be a national assembly'.

Prior to this time, important events within the blood transfusion world had taken place that would have a significant impact on the national blood service in England. The unofficial meeting of the Regional Transfusion Directors (RTDs) was the only central coordinating body from 1946 until the establishment of the Central Committee of the National Blood Transfusion Service (CCNBTS). Correspondence from the National Archives in Kew provides a fascinating insight into the views of some of those working within the NBTS, the Blood Products Laboratory and the Department of Health and Social Services (DHSS) at that time regarding a DHSS-led exercise on what became known as the 'Future of the Blood Transfusion Service'. On 9 January 1973, the Standing Medical Advisory Committee considered a paper prepared by the RTDs and presented by Dr William d'Auvergne Maycock, consultant advisor to the DHSS on blood transfusion, requesting that the NBTS be unified under a centralised administration responsible directly to the DHSS. A small committee was formed to consider 'whether any change should be made in the present organisation of the blood transfusion services in England and Wales and to make recommendations'. The committee consisted of representatives from the DHSS, including Dr Bill Maycock, two of the RTDs (Dr Jack Darnborough and Dr Chris Bowley - who tragically died in an air crash in March 1974), Dr Pat Mollison and representatives from the Welsh Office and the relevant Royal Medical Colleges. A report from this committee led to the formation of the CCNBTS in 1975.

A letter from Dr Maycock sets out the limitations of the NBTS at that time. In particular, he described the worsening shortage of blood in the two southern metropolitan regions, comparing the unfavourable proportion of donors in England and Wales to the proportion in Scotland and suggesting that the situation could be attributable to the poorer funding of the NBTS south of the border. He concluded with a recommendation for a review of the service's adequacy to meet future needs. In a separate letter, Dr Maycock suggested that all the UK services should be amalgamated but realised that 'the principle of devolution is insuperable'. During this period, there was correspondence between London and the Welsh Office regarding the ongoing discussions about the future of the NBTS; there was clearly some tension evident in the correspondence, the Welsh Office believing that representation from Wales was sometimes inadequate.

In 1980, an advisory committee was formed, but progress was slow. Although the case for a truly national blood service had been made by Dr Harold Gunson and approved by the Advisory Committee in 1986, the National Medical Director of the Scottish Blood Transfusion Service, Professor John Cash, published a highly critical article in the British Medical Journal in 1987 about the inadequacies of the NBTS in England and Wales (Cash, 1987). Finally, on 1 October 1988, the National Directorate of the NBTS was formed, Dr Harold Gunson taking the role of National Director. Coordination of the Regional Transfusion Centres (RTCs) was now formally established, as was the national monitoring of performance and planning of the supply of blood components to hospitals and the supply of plasma to BPL. As a consequence, there were some significant improvements, such as better coordination during the Gulf War in 1991 and an enhanced compliance with quality standards. However, the National Director had no formal authority in managing the RTDs, who had found new responsibilities and freedoms with the advent of the NHS internal market. Consequently, the National Blood Authority (NBA) was set up in April 1993 as a Special Health Authority, and in 1994, the NBA assumed executive control, becoming the statutory body for the management of the English blood transfusion service, BPL and the International Blood Group Reference Laboratory.

The Rhydlafar blood transfusion centre in south Wales did not become part of the NBA but remained under the control of the Welsh Office, being directly managed by the South Glamorgan Health Authority before this responsibility was moved in 1991 to the Welsh Health Common Services Authority (WHCSA), which had been established in 1985. John Redwood initiated the dismemberment of the WHCSA during his period of office as Secretary of State for Wales from 1993 to 1995. At this time, plans were being drawn up to move from the ageing Rhydlafar blood centre, and in 1997, NBTS (Wales) moved to the modern, purpose-built premises near Talbot Green and Pontyclun. The building had been designed to offer excellent laboratory and office facilities within easy reach of the M4 motorway. No changes were made to the existing arrangements of the role of the Mersey Regional Blood Transfusion Centre in the collection and supply of blood in North Wales.

## DEVOLUTION AND THE WELSH BLOOD SERVICE

A landslide victory for the Labour Party brought a change of government in 1997 that had profound implications for the NHS in Wales. Labour had promised a referendum in Wales on the question of devolution, and this was organised without delay. The referendum was duly held on 18 September 1997: there was a narrow majority of Welsh people voting for devolution; November saw the first reading of the *Government of Wales Bill*; and royal assent was subsequently given to the *Government of Wales Act 1998*. The opening ceremony of the new National Assembly was held in May 1999, attended by Her Majesty the Queen, His Royal Highness the Duke of Edinburgh and His Royal Highness the Prince of Wales.

The final decision to dissolve WHCSA was also made in 1997. Because of the experience of the Velindre NHS Trust in the provision of a national service (Breast Test Wales), and because the Trust was not a direct service user of the blood service, it was decided that the Velindre NHS Trust should host what would become the Welsh Blood Service (WBS), or Gwasanaeth Gwaed Cymru in Welsh. The Director of the WBS, Dr Gail Williams, chaired a Transition Steering Group and transition was completed by 1999. The move was formalised by the Welsh Assembly through the Velindre National Health Service Trust (Establishment) Amendment Order 1999.

## DEVELOPMENTS IN MANUFACTURING AND TESTING

While this period saw many, significant changes in the management of the service and in the laboratory aspects of the service (such as the introduction of anti-HIV testing in 1985 and anti-HCV in 1991), organisational change in blood collection was slow. It was not until 1999, following a lengthy review, that nurse-managed collections teams were instigated. The immediate impact of this change was an improved ability to keep collection sessions open at lunchtimes at the majority of venues, an important improvement given the continuing increase in demand for blood and blood products.

Methods of preparing platelet concentrate and cryoprecipitate date back to the 1960s, but it was not until the widespread introduction of plastic bag systems for the collection, processing and storage of blood components that component therapy took a form recognisable in today's blood services. In the UK, plastic donation packs were not universally adopted until 1975; they were in common use in Rhydlafar in 1972, but recycled, sterile glass bottles were still being used for blood collection in 1973. By the time the Welsh Blood Service was operating in its new blood centre in Talbot Green, the routine use of red cell concentrate, platelets, cryoprecipitate and fresh frozen plasma had contributed to a major change in the design and philosophy of the service. Clinicians continued to find important new uses for blood components, for which they expected a timely and sufficient supply from the blood service.

An early success of the blood service in Wales was the development of the Welsh Regional Tissue Typing Laboratory in 1974. Its progress was rapid. H&I support for the local haematopoietic stem cell transplant programme commenced in 1979 and in 1983 for solid organ transplants. Scientific innovations included testing for platelet antibodies and antigens (1984), the use of the mixed lymphocyte reaction (1986) and DNA technology (1985). In 1985, the Welsh Bone Marrow Registry was established (for review, see Darke, 2000). The Tissue Typing Laboratory was renamed the Welsh Transplantation and Immunogenetics Laboratory (WTAIL) in 1995 and has developed a worldwide reputation for its many publications.

Computerisation within blood services did not appear in the UK until the 1980s, and commercially available customised software with blood transfusion functionality arrived much later; hitherto, paper records were used for important data recording, with all of the known potential for transcription error. Consequently, in 1982, in-house software was developed for the blood transfusion and WTAIL laboratories within the WBS. The group within the WBS that was instrumental in introducing and maintaining the software became known as the TRACE consortium, headed by Dr Alan Beal in Cardiff and chaired by Dr Willem Ouwehand in Cambridge. The software was also used by some of



Fig. 3. Demand for red cells in Wales 1988-1997.



Fig. 4. Calendar celebrating 50 years of NBTS (Wales).

the English blood centres. However, it was unsuccessful in winning the 1994 tender for the integrated system being introduced by the English NBA, the system chosen becoming known as PULSE. However, TRACE continued to maintain and modernise the Welsh system, e.g. introducing micro computers at blood donor sessions in 1994. By this time, the Technicon BG-15 used for blood grouping of donations had been replaced by the Autogrouper AG16C, which allowed automatic interpretation of reaction patterns in a form that could be transmitted to the blood service computer system. The AG16C was replaced in 1989 by the more sophisticated and quicker Olympus PK7100, up-to-date versions of which are still in use in the Welsh, English and Scottish blood services.

The demand for red cell transfusion in Wales closely paralleled the demand in England, with hospitals requesting more red cells year after year (see Fig. 3). By 1996, the 50th anniversary of the blood service in Wales (see Fig. 4), Welsh hospital demand had reached its peak of about 105 000 red cell units annually. The high demand for red cells at that time, compared to current demand, was the result of poor blood management policies; in Wales, one report indicated that at least 15% of blood was being wasted (Napier *et al.*, 1985).

## NEW DEMANDS ON THE WELSH BLOOD SERVICE 1997–2015

In 1997, the WBS settled into its new headquarters with its new reporting arrangements to the Velindre NHS Trust, an arrangement that continues to the present day. During this period, the Trust underwent a significant expansion and was not significantly affected by the NHS Wales reorganisation in 2001, which removed the five health authorities and gave responsibility to 22 local health boards (LHBs) for primary, secondary and community healthcare. Health Commission Wales replaced the Local Health Groups (part of the Health Authorities) and took up responsibility for commissioning the work of the Welsh Blood Service. In 2009, the number of LHBs was reduced to seven, and the number of NHS Trusts was also reduced, although responsibility for public health was removed from the Velindre Trust and transferred to a new Public Health Wales NHS Trust. Commissioning of the Welsh Blood Service moved to the Welsh Health Specialised Services Committee (WHSSC) in 2010.

During this period, the WBS, unlike its English counterpart, has not made cost-per-item charges to hospitals for the supply of blood components and related services, direct funding being provided through the commissioning model. Cost-per-item charges have been introduced in many Western blood services, generally supported by the rational belief that not doing so could lead to an inappropriately high usage of blood. However, although red cell usage in South and Mid Wales remained higher per head of population than that seen by NHS Blood and Transplant (NHSBT) in England and North Wales (36 per 1000 compared to 31 per 1000 in 2013-2014, respectively), the falls in usage over this period were almost parallel (see Fig. 5) and were closely related to the Better Blood Transfusion and Patient Blood Management initiatives in both countries. In the UK as a whole, the four national blood services collected over 2.8 million whole blood donations during 2000-2001, with an estimated cost of £898 million to the NHS and society as a whole (Varney & Guest, 2003).



Fig. 5. Demand for red cells in WBS and NHSBT: 2000-2014.

The responsibilities of the UK blood services with regards to microbiological transmissions was brought sharply into focus following the landmark victory for 114 people who had become infected with hepatitis C from blood transfusions. Under the Consumer Protection Act, Justice Burton ruled in March 2001 that the National Blood Authority in England and the Velindre Trust in Wales were liable even if they had not been negligent because they should have taken steps sooner to reduce the risk of transmitting the virus. Collaboration and coordination between the four UK blood services regarding the introduction of precautionary measures and microbiological screening became more effective following the formation of the UK Blood Services Forum (UKF) in 1999, which comprised the chief executives and medical directors of the four services. The professional work of the UKF continues to be undertaken tirelessly by the Joint Professional Advisory Committee (JPAC).

The risk of transmission of infectious agents through blood transfusion has been a continuous concern to the WBS as it has been for all blood services. The emergence of variant Creutzfeldt-Jakob disease (vCJD) in 1996 in the UK population as a result of eating contaminated beef has been a huge challenge as this deadly and unusual disease has proven difficult not only in the detection of the pathogen but also in the creation of measures to reduce the risk of transfusion transmitted infection. It soon became apparent that there was a possibility of transmission of the disease from an infected blood donor, with the Spongiform Encephalopathy Advisory Committee estimating that 1:4000 of the population could become carriers. The UK blood services put in place a number of precautionary measures, including the leucodepletion of all blood components (except granulocytes), banning the use of UK plasma for fractionation, importing some blood components for vulnerable groups of patients and deferring previously transfused donors. The UK Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) provided expert advice on these matters to the Welsh

Government, and continues to do so, on all aspects of the safety of blood transfusion.

## CHALLENGES AND PROGRESS IN THE 21ST CENTURY

The WBS is charged by the Welsh Government to be the supplier of blood components for NHS Wales. This means it must ensure that supplies are sufficient to meet demand in compliance with relevant regulatory and statutory requirements. The introduction of the EU Blood Directive [transposed into UK law in 2005 as the Blood and Safety Quality Regulations (BSQR)] resulted in a phased shift in the extent of regulatory compliance required, and the MHRA as the UK's competent authority has been diligent in ensuring a consistent standard of compliance within the UK blood services. These developments have meant that the standard of premises in which blood component collection and manufacturing take place, and the quality systems and resources required to support this activity and maintain licences, became significantly more stringent within the UK. Significant investment in premises and the quality department was required to ensure that all systems and processes within the WBS met the required standards. Some departments have been required to meet multiple standards; e.g. WTAIL is regulated by the BSQR, the Human Tissues Act and the requirements of the European Federation for Immunogenetics and Clinical Pathology Accreditation. Notwithstanding these increased demands, WTAIL continued to develop its portfolio. In 2000, it began to host UK NEQAS for H&I; in 2007, it was the first UK bone marrow registry to type donors at high resolution; and in 2013, the WBMDR became a donor centre of the US National Marrow Donor Program. By June 2015, over 50% of the WBMDR panel had been typed at high resolution.

Prior to these major regulatory changes, the Better Blood Transfusion (BBT) Team was established early within the WBS



Fig. 6. Mark Drakeford, Minister for Health & Social Services (2013–2016), in front of one of the bloodmobiles.

in 2004 as an independently funded Welsh Government initiative to support the implementation of Better Blood Transfusion in Wales (WHC 2002/137). Initially, a Clinical Lead Consultant, manager and three hospital-based transfusion practitioners (TPs) were appointed. The aim was to provide experts to work within the three largest acute Trusts whilst also developing, supporting and disseminating best practice throughout all Trusts. Significant progress was achieved, including the establishment of a national cell salvage database, the adoption of education standards across Wales and the development of local and national audits. More recently, BBT Team activities continue to support the safe and appropriate transfusion through the standardisation of process and practice to drive out variation and to streamline the patient pathway with education in the non-medical authorisation of blood transfusion. With the launch of Prudent Healthcare by the Welsh Government in 2015, the focus of the BBT Team has expanded to encompass a more holistic approach.

Although the Welsh Blood Service had kept abreast of major technical developments, by 2006, it was becoming clear that significant organisational change was needed to move the service forward. A service review was announced, and this was followed shortly afterwards by a more comprehensive strategic review. This began its work in 2008 and culminated in reports to the host Velindre Trust and to the Welsh Government in the spring of 2009. A wide range of improvements was identified in the report. One recommendation soon implemented was the purchase of equipment to allow the Welsh Blood Service to undertake nucleic acid testing (NAT) of blood donations for infectious disease, a service that had previously been undertaken by the NHSBT on behalf of the WBS. There were three recommendations, however, that took much longer to consider and act upon.

First, it had been recognised for some time that the TRACE blood establishment computer system (BECS) in use in the WBS was insufficiently flexible to meet the demands of a modern blood service. A number of options were considered, and in 2009, it was agreed that the WBS should tender for a new BECS through the formal EU process. By 2010, a decision had been taken to procure the MAK computer system, but it took 5 years for the system to be designed, tested and validated to the rigorous standards demanded by the MHRA before it was launched live. The MAK system is also used in Scotland and Ireland and in many countries throughout Europe and worldwide.

The strategic review also identified that the collection model in use needed modernisation. It had been developed more for the convenience of staff than of donors; the collection team staff, while assuredly dedicated to the service, were not organised in ways that provided the required flexibility in responding to new demands in workload and regulatory requirements. In 2010, external consultants McKinsey undertook a review of the existing Talbot Green Donation Clinic, bloodmobile and community donation sessions, the aim being to identify opportunities to improve donor and staff experience, quality and collection performance. McKinsey recommended a number of improvements around clinic processes, roles, performance management and appointments. With some amendments based on research and best practice cited in other blood collection establishments, a collection process was piloted at the newly refurbished Talbot Green Clinic to test the planned process improvements.

The scope of the McKinsey study was intentionally limited, and so, working groups were established to examine in detail the breadth of factors believed to be critical to the overall success of the modernisation programme. Proposals on clinic opening times were informed by research using the whole blood and apheresis donor panels. In March 2011, a survey was distributed to over 6000 whole blood donors, and in April, a survey was distributed to 681 registered and existing apheresis donors. Based on this work, new clinic times were proposed to improve donor recruitment, retention and donation frequency. From the outset, staff were involved in redesigning the service, and the pilot clinic in Talbot Green gave tangible visibility of the new process and new, multi-skilled roles. The full roll-out of the plan was a significant challenge for the WBS because of the amount of training required with consequential loss of blood collection resource, and occasional support from NHSBT was required. However, the roll-out was complete by 2014. By this time, a new blood collection team base in West Wales had been commissioned, and three new 'bloodmobiles' had been purchased - one 3-bed and two 6-bed vehicles - as there was persuasive evidence that this collection model was more efficient and more flexible for the WBS. Fig. 6 shows a photograph of one of the 6-bed blood mobiles with the new WBS logo and colours.

## A WELSH BLOOD SERVICE FOR THE WHOLE OF WALES

The question of North Wales was also identified within the strategic review as one that required a definitive answer. Within the UK, responsibility for healthcare is devolved to the four

health departments. In England, Scotland and Northern Ireland, the health departments each have responsibility for a single blood service, with a consequent direct influence on decision making and policy. At the time of the WBS strategic review, this was not the case because, for historical reasons (see above), the hospitals in North Wales were supplied by NHSBT from the Liverpool centre. Blood collection in North Wales was also undertaken by NHSBT. This unusual complexity in Wales had been noted many times since the formation of the Welsh Government in 1999. The WBS strategic review submitted to the Welsh Government in 2009 included a request for strategic direction on this question. After consideration by the government and by Betsi Cadwaladr University Health Board (which has responsibility for all hospitals in North Wales), the Minister for Health and Social Services in Wales announced, on 13 June 2012, the need to establish an All Wales Blood Service. This statement included a clear intention to move towards establishing such a provision by 2016. Subsequently, on 20 September 2012, the Welsh Government wrote to the Chief Executive of the Velindre NHS Trust about Terms of Reference for the project board as agreed by the Minister.

Detailed work on the change started early in 2013 and involved a close liaison with NHSBT, legally underpinned by the NHS Blood and Transplant (Gwaed a thrawsblaniadau'r GIG) (Wales) (Amendment) (No. 2) Directions 2015. It was clear from the outset that a new regional base would need to be established near the North Wales hospitals to ensure that blood components could be transported quickly as required. This regional base would also serve as a collection point for blood donations taken in North Wales for transport to the Talbot Green testing and processing centre. A site was identified in Wrexham, and this was finally commissioned in March 2016. A total of 41 NHSBT staff working in North Wales were transferred to the Welsh Blood Service through a TUPE arrangement, and 16 new jobs were created in North and South Wales to accommodate the new all-Wales blood service, which went live in May 2016. Not only was the creation of this new service a logical change from the perspective of a devolved government, but the Welsh Government was able to realise financial savings.

Finally, 26 September 2016 marked the 70th anniversary of the Welsh Blood Service. During those 70 years, some of the many changes that it has seen have been chronicled above. Today, it is a modern, flourishing blood service that sits comfortably within the highest standards operated by the UK blood services, serving a population of over 3 million people and providing blood directly to 18 hospitals throughout Wales. Ultimately, the future success of the WBS relies on it being able to continue to harness the undoubted generosity of voluntary blood donors in Wales. As in other blood services, the path ahead in this respect is unpredictable but enormously rewarding.

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#### **CONFLICT OF INTEREST**

The author has no competing interests.

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