Welsh Ambulance Services NHS Trust

Research and Innovation
Annual Report 2015-2017

'To build a culture where research can flourish, influencing practice for patient benefit'
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*Note: Other versions of this document, including Welsh, can be made available upon request.*
Executive Summary

Research and innovation are core activities for the Welsh Ambulance Services NHS Trust (the Trust) in order to enable us to develop and deliver effective and efficient care. The Trust has a long and well established reputation in delivering high quality research through its Pre-Hospital Emergency Research Unit (PERU). This annual report presents the progress made against the Trust’s 2015-2019 Research and Development (R&D) Strategy. The activities outlined in the report reflect the major advances which have been made in recent years, and the growing confidence in the organisation. Likewise, the Trust has seen significant increases in the scale, complexity and breadth of research and innovation in recent years.

Research and innovation can be considered a journey, from the development of ideas through to large scale evaluation and dissemination, and activities within this report are at different stages in this journey. With our partners we have developed ideas such as paramedic initiated FICB for hip fracture, pre-hospital antibiotic in SEPSIS and TIA referral by paramedics to specialist clinics which, following rigorous research, may become core practices in the pre-hospital environment. We are also exploring the effectiveness of treatments which may have been adopted in the absence of robust evidence, such as the PARAMEDIC-2 study which is evaluating the role of adrenaline in Out-of-Hospital Cardiac Arrest (OHCA) and is now the largest resuscitation drug trial in Europe. Wales has made a significant contribution to the PARAMEDIC-2 study and, through delivering this and other research mentioned within this report, the Trust continues to build its capacity and reputation for conducting large scale complex research trials. The findings and knowledge gained from research and innovation must be translated into practice if they are to positively impact on patient care. This report presents activities which demonstrate the transfer of knowledge through publications, presentations, and most notably the National Institute of Health Research (NIHR) themed review of Research for Ambulance Services which presents the breadth of ambulance service research funded by the NIHR over recent years, and to which we significantly contributed.

Finally, a key message in this report is one of collaboration, where a wide range of individuals including clinicians, Clinical Contact Centre staff, leaders, administrators, research and academic partners have worked together to develop and deliver the aspirations contained within our strategy.

Dr Brendan Lloyd
Medical Director
Introduction

The research and innovation functions for the Welsh Ambulance Services NHS Trust (the Trust) are facilitated by the Pre-Hospital Emergency Research Unit (PERU). PERU is responsible for developing and implementing strategies and related plans for the Trust’s research and innovation function.

PERU is funded by Health and Care Research Wales (HCRW), which is the R&D arm of Welsh Government. The NHS in Wales has long supported the influence of research and innovation to improve the health and wealth of the nation. This was laid out in the report Together for Research and Innovation: A Health and Social Care Research and Development Strategy 2012-2015 (WG 2012), which sought to stimulate and reward excellence and innovation, improve the research environment and invest in the future. It is therefore recognised that research and innovation are core activities of the Trust and this is reflected in our 2015-2019 Research & Development (R&D) Strategy, with a vision to: *Build a culture where research can flourish influencing practice for patient benefit.*

This report presents the activities that PERU and the Trust has engaged in between 2015-2017, and considers progress made against the 2015-2019 R&D Strategy.

The Research and Innovation Environment

Within the R&D Strategy it was recognised that before embarking on significant change there was need to understand the current situation, critical factors which may affect the change and what success would look like. The first step in this process was reflected in the 2015-2019 R&D Strategy which states: “We will measure this success by developing and administering a research capacity assessment tool. This tool will be informed by the literature and grounded in the research and development environment within the Trust”

It was established early that such an R&D capacity building audit tool existed, and in 2015, along with all other UK Ambulance Trusts, the Trust engaged in a research capacity building audit through the National Ambulance Research Steering Group (NARSG). This audit provided the information needed to ensure resilience and capacity to continue to attract and deliver high quality research and innovation. The audit covered areas of finance, governance, collaboration, policy, education and skills development.

In order to develop and deliver high quality R&D an organisation needs an efficient and effective R&D office, which is based at PERU. In recent years, the PERU has undergone a transition with staff movement, which posed a potential threat to the integrity of the research environment. In order to sustain the R&D office function and retain resilience throughout this transition, a restructure within the department and renegotiation of finances allowed for key appointments and longer term sustainability. PERU has emerged from this transition with a skilled and efficient core of staff, including: a Head of Research and Innovation, Research Officer, Research Assistant and Finance Support. The research team is supported on a study by study basis with seconded Research Support Officers, who are funded through application of the AcoRD framework.
Skilled Staff and Building Capacity

Within the R&D Strategy a commitment was made to: “Support and develop our clinical leaders in being active participants in research and development processes. We will also support the development of a range of skills, and understandings and tools to integrate research, and the evidence gained in to their daily practice, and activities such as clinical supervision, leadership and education.”

In order to achieve this and create an inclusive and sustainable R&D future, we have made progress in the following areas:

- We aimed to develop the number of principal and chief investigators within the Trust and PERU. We now have two Chief Investigators (CIs) leading collaborative studies. We are also expanding our number of Principal Investigators (PIs) to include areas such as the Clinical Contact Centre, Workforce and Organisational Development.
- We recognised that research and innovation is an integral component in clinical leadership and we continue to support and influence this through clinical structures within the Trust. Research is a significant element of roles such as Advanced Practitioners, Clinical Team Leaders, Nursing and Medical Staff, and we continue to influence this acknowledgement in job plans and annual appraisals.
- We sought to support the development of critical appraisal skills, supporting education and increased knowledge mobilisation. Staff within the Trust have now been trained to deliver research, and we have a range of staff contributing to Research Trial Management Groups. Staff are also are encouraged to undertake the Good Clinical Practice course (GCP), face-to-face or online. GCP covers international standards of governance, ethics and clinical practice in research.
- Working collaboratively with Learning and Development, PERU has made available an individual portfolio for all Trust staff.
- We have provided learning opportunities in the form of CPD events and research grant writing courses with the Research Design and Conduct Service, and attracted and advertised funded MSc programmes in areas such as Informatics and Research based PhD opportunities.

Collaborations

The funding for high quality research and innovation is becoming increasingly competitive and in order to be successful, strong partnerships and collaborations are necessary. This was recognised in the R&D Strategy, which pledged that: “We will work collaboratively with local, national and international research partners. Engaging with industry, commerce, voluntary, NHS and health research organisations.”

The NHS Wales Planning Framework recognises how relationships between Universities, Health Boards and Trusts are critical and require a structured approach to research, teaching and innovation. This has been recognised in our Integrated Medium Term Plan (IMTP), and during 2015 PERU has built on longstanding partnerships.

PERU supports undergraduate and postgraduate programs at the Swansea University College of Health Sciences. We were successful co-applicants and Executive Board
Members on the Primary and Emergency Care Research Centre ‘Prime Centre Wales’, funded by HCRW for £2,990,000. PRIME Centre Wales aims to improve the health and wellbeing of people in Wales and internationally through undertaking high quality research on topics of national policy priority which contribute to the evidence base in primary and emergency care, and ensuring that research findings are translated into policy and practice. Swansea Trials Unit are the Trust’s HCRW designated Trials Unit. The Trust was a co-applicant on the funding bid for the Trials Unit and continues to benefit from high quality support through the Research and Design Service.

The Trust is represented on many other collaborations and bodies, including:

- National Ambulance Research Steering Group – Board Member
- National Ambulance Service Medical Directors Group
- College of Paramedics
- HCRW Clinical Research Time Award Panel
- International links in Sweden, USA, Australia and Canada
- The Bevan Commission
- The Life Sciences Hub Cardiff Bay
- Health and Care Research Wales NHS Delivery – Board Member
- Health and Care Research Wales All Wales R&D Managers Forum (FORWARD) member
- South East Wales Academic Health Sciences Partnership Executive Board Membership
- A Regional Collaboration for Health (ARCH)

**Grants and Funding Secured**

PERU attracts external funding from HCRW to deliver a Research and Innovation office function and to develop high quality research. Along with this we have successfully collaborated on funding applications totalling £5,010,637, which includes Swansea Trials Unit and PRIME Centre Wales. £1,220,637 of this has been directly secured by the Trust and PERU. In a recent performance review the Trust was applauded for their ‘exemplary’ use of the AcoRD framework for attracting funding to support research.

**Current Research**

All of our research involves collaboration with many partners, within the principles of the Involving People Framework and has significant patient and lay involvement. Patients are involved as equal partners in our research from the generation of ideas through to the design, delivery and analysis of findings to dissemination of results.

In 2015-2016 several studies closed to recruitment including the SAFER 2 Trial which aimed to determine the clinical and cost effectiveness of a paramedic protocol for the care of older people who fall; the results are now being written up and will influence an international audience. The PARAMEDIC cluster randomised controlled trial involved 4471 patients in cardiac arrest, and found no evidence of improvement in 30
day survival with mechanical compression device compared with manual compressions. The PARAMEDIC Trial was awarded Trial of the Year in 2016 by the Society of Clinical Trials, and was published in the Lancet.

Since publication of the 2015-2019 R&D Strategy, there has been a significant increase in recruitment of participants into studies. Health and Care Research Wales 2015/16 performance monitoring reported a 906% increase in recruitment into research studies within the Trust. Whilst this figure exaggerates performance due to the low numbers of studies and short term fluctuations, there have been significant increases in the quantity, quality and diversity of studies being conducted in the Trust in recent years.

In 2015 the PARAMEDIC-2 Trial exploring the role of adrenaline in out-of-hospital cardiac arrest opened in Wales. PARAMEDIC-2 is a randomised placebo controlled Clinical Trial of a Medicinal Product (CTIMP) and is the first CTIMP the Trust has been involved in. CTIMPs are regulated by the Medicines Health Regulatory Authority (MHRA) and require rigorous observance of legislation and policy, and high standards of governance and clinical practice. PARAMEDIC-2 is now the largest resuscitation drug trial to have been conducted in Europe. The high standard of delivery of PARAMEDIC-2 from all staff in the Trust, and lessons learned, gave confidence to delivering future CTIMPs, and in 2016 our second CTIMP, Rapid Intervention of GTN in Hypertensive Stroke (RIGHT-2), opened to recruitment.

Whilst the Trust continues to attract and deliver high quality internationally significant research, success is also being achieved in developing research from within Wales. Our collaborations with Prime Centre Wales and Swansea Trials Unit have led to the Trust winning grants to conduct feasibility studies in areas of stroke, hip fracture and sepsis. By such development of our own research ideas, the research agenda can be influenced by local priorities. For instance, stroke is recognised as a major health concern for health services in Wales. Working closely with our Trust Lead on Stroke PERU has made a commitment to focus on delivery and development of pre-hospital stroke research, along with translating these findings into policy.

Through our networks, we contribute to the Welsh Government Stroke Research and Stroke Implementation groups. We also have strong links with the stroke speciality research lead, clinical lead, nursing and medical colleagues across Wales. The Trust is currently delivering two high quality stroke portfolio trials, and leading a feasibility portfolio trial on Transient Ischemic Attack (TIA). Recognising our commitment to stroke research, a collaborator on some of these studies, Professor Gary Ford tells how:

“Ambulance paramedics play a key role in the effective early management of medical emergencies in the community. Provision of timely effective care for acute stroke patients has been achieved through paramedics identifying and rapidly transporting FAST positive patients to hyperacute stroke units. Ambulance services are making a major contribution to improving future stroke care by undertaking pre-hospital trials in acute stroke that will provide the evidence base for benefits of paramedic led care pathways and treatment for acute stroke.”
Prof Gary A Ford CBE  
Chief Executive Officer of the Oxford AHSN  
Co-developer of the Face Arm Speech Test (FAST)

Within the 2015-2019 R&D Strategy an aspiration was set to increase the breadth of studies, in which it was stated that: “We will continue to enquire and evaluate the contribution of pre hospital and emergency care to patients through our practices, but also the value in public health such as modifying help seeking behaviour”

The EDARA study is multi-centre research, led by Cardiff University, which aims to evaluate the effectiveness, cost-effectiveness, efficiency and acceptability of Alcohol Intoxication Management Services (AIMS) in managing alcohol-related Emergency Department attendances.

**Innovation**

It has long been an aspiration that research and innovation can improve the health and wealth of the nation. The Trust has always engaged in partnerships with industry, academia and other health and social care providers. Innovation however extends beyond the funding and scope of Research and Innovation, and rather falls on a spectrum which crosses many disciplines including service and quality improvement, planning and development of technology and devices.

There is a growing life sciences network in Wales, where future collaborations can yield advances in a range of technologies, devices and ways of working to improve care and the economic prosperity of Wales. The Trust must however work within current legislation, policy and guidelines. An integral part of any commitment to delivering the best possible standards of patient care, whilst developing, incentivising and sharing benefits of research and innovation is the approach taken to the issue of Intellectual Property (IP).

It was recognised in the R&D Strategy that IP that arises from innovation needs to be properly managed to ensure the benefits for service users are maximised. The Trust has tailored the Health and Care Research Wales’ Intellectual Property Policy for an Ambulance Service context and has now adopted it into Trust policy. During this process it was recognised how a Wales-wide approach would be a long term aspiration, and we continue to work with our networks and partners in this endeavour.

Innovation can sometimes seem an abstract concept; it is not the preserve of senior academics or leaders, rather an opportunity for all to contribute to ideas and activities to improve care. We have a commitment to creating conditions where Innovation can flourish; through clarity around policy, signposting collaborators and celebrating success, we are attempting to support an innovation culture.
Case Study of Innovative Research

The Rapid Analgesia for Pre-Hospital Hip Disruption (RAPID) feasibility study is assessing whether it is possible for paramedics to provide fascia iliaca compartment block (FICB) as analgesia to patients whom they have found to have a fractured hip. It is led by us in collaboration with Swansea University, Prime Centre Wales and ABMU Health Board. FICB is an injection into the hip which blocks the pain and this is the first time internationally that paramedics have routinely provided FICB. Within this trial we have worked with Trauma Simulation, which is a Swansea University spin-out company created to enhance the development of the limb trauma training models produced in prototype, and enhance the trauma training experience available without resorting to animal or human cadaveric material. 3D imaging and custom silicone polymers are used to create the skin, fat, blood vessels and other internal organs accurately reproduce the weight, physical feel and handling properties of human tissue. These models are so innovative they are the first available models for FICB, and have been used for training FICB in the RAPID Trial thus reducing need for training on volunteers.

Knowledge Transfer, Dissemination and Impact

Patients can only benefit from research when findings are translated into real-world practice. In our strategy we therefore made a commitment to a strong emphasis on the development of the evidence-base for health improvement through evidence informed policy development. The evidence gathered through previous research has gone on to influence in high level areas, such as international Resuscitation Guidelines, Welsh Government Policy and UK parliamentary enquiries.

Spreading and applying evidence in a health system is a complicated task and various individuals and organisational factors affect it. We have worked with leaders and policy makers in pre-hospital and emergency care to support the synthesis of the best available evidence into practice. This approach has been employed in many areas within research and innovation and PERU continues to offer advice and support to a range of groups including the Clinical Pathway Advisory Group (CPAG), Clinical Equipment Group, and the Quality Steering Group (QSG).

Knowledge transfer has also occurred in many other activities, such as publication of journal articles and presenting at conferences and events. Appendix A captures some of this activity, and covers a broad range of topic areas from student research to publications in journals such as the Lancet. Likewise, presentations have spanned locally led learning events to national and international conferences.

The Trust’s Executive Medical Director and Head of Research and Innovation contributed to the development of the National Institute for Health Research (NIHR) Dissemination Centre’s first themed review of Research in Ambulance Services. This
themed review brought together the last twenty years of research and will be an influential document and essential reading for everyone involved in the planning and delivery of ambulance services.

**Improving Quality Together**

In addition to the several collaborative research studies detailed within this report, the Trust has adopted the national learning programme for NHS Wales – ‘Improving Quality Together’ (IQT - 1000 Lives). This programme offers a consistent methodology for improving the quality of services. It enables individuals / teams to utilise the ‘Model for Improvement’ (Associates in Process Improvement, 1996). This model supports small scale cyclic testing of new ways of working, which potentially creates positive / practical changes to improve services.

The IQT framework has three main levels: ‘Bronze’ – an online introduction to quality improvement; ‘Silver’ – a short course that helps to put the Bronze level learning into practice, as an improvement project; and, ‘Gold’ – a network of improvement coaches supporting staff doing Silver level projects.

Our approach is to adopt this IQT framework involves: making Bronze level online training available to all staff (to date 486 staff have completed the learning modules); including the Silver level course in the upcoming Team Leader development programme; and, forming an IQT Forum to develop both teaching and coaching plans to support staff undertaking their Silver level course and projects.

By adhering to the principles of IQT, the staff will be provided with an equitable, and consistent framework to test change through the recognised processes of planning, action, and analysing results. Importantly, through the IQT Forum, we will continuously increase our quality improvement capacity and capability, and ultimately embed a culture of improvement throughout our organisation.

**How do we know we are succeeding?**

In our Research and Development Strategy, in answer to the question *What will success look like?* It was recognised that:

- Undertaking high quality research can be time consuming and costly. Success will be realised through a combined effort and recognition that all in the Trust have a contribution and responsibility for research and development.
- Success will come in the form of maintaining the position and reputation of PERU and the Trust as leaders in pre-hospital and emergency research and innovation. Continuing to attract, and build on the high quality research will signify success
- When research and innovation becomes an accepted and embedded function in varying degrees in the Trust we will know we are succeeding
- The success of this strategy will be felt as the engagement in and output of research and development continues to benefit our patients.

Many examples have been put forwarded in this document which point to us meeting these aims. There is tangible evidence in the form of increased activity reporting through HCRW performance monitoring of number of studies and patients recruited
into studies. Our studies now cover all areas of Wales, across many disciplines, and the majority of frontline staff have now been trained to deliver one of more of our trials. However, we will measure this success in the coming years, by again administering a research capacity assessment tool.

**CPD Events 2015- 2017**

- 23 June 2015 ABUHB R&D Conference
- 4 November 2015 EMS UK Learning Event
- 7 December 2015 SEWAHSP Conference

2015 999 EMS Research Forum

- 8 March 2016 College of Paramedics Annual Conference

- 7 April 2016 Cardiac Arrest Symposium – College of Paramedics and WAST
- 15 April 2016 WAST Big Bang paramedic recruitment event
- 16 May 2016 Welsh International Symposium on Emergency Medicine
- 25 May 2016 Innovation Event University of South Wales –SEWAHSP & WAST led
- 21 June 2016 ABUHB R&D Conference
- 23/24 June 2016 Wales Stroke Conference
- 6 July 2016 Mediwaless NHS Connects Conference
- 13 October 2016 Stand at Health and Care Research Wales Conference
- 17 October 2016 Stand and Presentation at EMS UK Learning Event
- 16 November 2016 Research and Innovation in Pre-Hospital and Emergency Care – WAST, College of Paramedics, EMRTS led
- 27 February 2017 WAST Falls Workshop
- 1 March 2017 Involving People Annual Meeting
Conclusion

The purpose of research is to inform action. We recognise that research and innovation has a vital contribution to make to the care and services provided to the patients in Wales.

We articulate our intention for Research over the forthcoming years in the Trusts Integrated Medium Term Plan. The strategic path we will follow will be influenced by these shared aims and objectives and ensuring we hold the patient at the centre of all we do.

This is reflected in our vision:

*To build a culture where research can flourish, influencing practice for patient benefit.*

Our journey over the next five years will present many challenges which will require effective collaborations with patients, clinicians, leaders and policy makers. However, the potential rewards lie in a rich source of innovative research to understand, evaluate and answer questions of the services and care we provide for patients.
## Research and Innovation in the Trust

<table>
<thead>
<tr>
<th>Research</th>
<th>Chief Investigator &amp; Sponsor</th>
<th>Funder/Grant value</th>
<th>Recruitment target</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIGHT-2</td>
<td>Prof Phillip Bath Nottingham University</td>
<td>British Heart Foundation £1,370,708</td>
<td>850</td>
<td>Rapid Intervention with Glycerol Trinitrate in Hypertensive stroke Trial-2 (RIGHT-2). RIGHT-2 is led by Nottingham Stroke Trials Unit and funded by the British Heart Foundation. It is a Multicentre prospective randomised single-blind blinded-endpoint parallel group trial, which is seeking to determine whether glycerol trinitrate improves outcome in patients with ultra-acute stroke. RIGHT-2 is Clinical Investigational of a Medicinal Product (CTIMP) and is therefore regulated by the Medicines and Healthcare products Regulatory Agency (MHRA).</td>
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<tr>
<td>RAPID</td>
<td>Nigel Rees WAST</td>
<td>Health and Care Research Wales Research for Patient and Public Benefit £228,759</td>
<td>50</td>
<td>Rapid Analgesia for Prehospital Hip Disruption (RAPID): a feasibility study for a randomised controlled Trial. The study aims to determine the feasibility of undertaking a randomised controlled trial (RCT) to test the clinical and cost-effectiveness of paramedics providing fascia iliaca compartment block (FICB) as early pain relief to patients who have fractured a hip at the scene of their injury. £228,759</td>
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<tr>
<td>TIER</td>
<td>Nigel Rees WAST</td>
<td>Health and Care Research Wales Research for Patient and Public Benefit £228,759</td>
<td>86</td>
<td>Transient Ischaemic Attack 999 Emergency Referral (TIER): feasibility Trial within the Welsh Ambulance Services NHS Trust (WAST). The study aims to develop and assess the feasibility of paramedic referral of patients with low-risk suspected Transient Ischaemic Attack (TIA) directly to TIA clinic for early specialist review, without going to the Emergency Department (ED). £228,759</td>
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<tr>
<td>PARAMEDIC-2</td>
<td>Gavin Perkins Warwick University</td>
<td>NIHR Health Technology Assessment Programme</td>
<td>8000</td>
<td>The PARAMEDIC-2 trial is a double blind placebo controlled trial looking at whether adrenaline is helpful or harmful in Out of Hospital Cardiac Arrest. Answering this question will help to improve future treatment of people who have a cardiac arrest. It is a Clinical Trial of a Medicinal Product, and is therefore regulated by the Medicines Health Regulatory Authority (MHRA). The trial is being delivered by the University of Warwick in partnership the University of Surrey and the Welsh, West Midlands, North East, South Central and London Ambulance Services. These ambulance services have experience of carrying out research.</td>
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<tr>
<td>Project Title</td>
<td>Investigator</td>
<td>Institution</td>
<td>Grant Number</td>
<td>Funding</td>
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<td>Stroke is responsible for a high global burden of mortality and disability. The most effective single emergency treatment for ischaemic stroke is thrombolysis using intravenous recombinant tissue Plasminogen Activator within 4.5 hours of symptom onset (rtPA), but outcomes are highly time dependent. PASTA is a cluster randomised control trial aiming to determine the feasibility, clinical and cost-effectiveness of an enhanced paramedic role during pre-hospital and acute hospital care to reduce time from admission to brain imaging and thrombolysis for appropriate stroke patients.</td>
<td>Dr Christopher Price</td>
<td>Newcastle upon Tyne NHS Foundation Trust</td>
<td>NIHR Programme Grant</td>
<td>3640</td>
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<tr>
<td>Evaluating the Diversion of Alcohol-Related Attendances</td>
<td>Prof Simon Moore</td>
<td>Cardiff University</td>
<td>NIHR HS&amp;DR</td>
<td>£925,000</td>
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<tr>
<td>Paramedic-supplied 'Take Home' Naloxone: protocol for cluster randomised feasibility study</td>
<td>Chris Moore</td>
<td>Swansea University College of Medicine PhD</td>
<td>Swansea University/WAST</td>
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<tr>
<td>Ethnography of 'Primary Care Sensitive' Ambulance Contacts*.</td>
<td>Matthew Booker</td>
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<td>Paramedics perceptions of caring for people who self-harm</td>
<td>Nigel Rees</td>
<td>Swansea University College of Medicine PhD</td>
<td>Swansea University/Falck Foundation</td>
<td>£6400</td>
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<tr>
<td>Ethnographic study of emotion work</td>
<td>Angela Williams</td>
<td>Swansea University</td>
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<tr>
<td>Department of Nursing</td>
<td>Broader political, economic and social climate and the well-publicised, relentless and unprecedented demands on emergency care provision.</td>
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<td><strong>Public and clinicians views of Prudent Healthcare</strong></td>
<td>Prudent Healthcare is a concept which seeks to change the culture of the NHS in Wales by ensuring that healthcare fits the needs and circumstances of patients and actively avoids wasteful care that is not to the patients' benefit. Prudent Healthcare recognizes the important contribution that members of the public have in maintaining their health and wellbeing. This study will advance our understanding of public, patient, and clinician awareness, experiences, and views about Prudent Healthcare in order to find ways of promoting the adoption of Prudent Healthcare principles across Wales. The study comprises two separate work packages, one focusing on public/patient attitudes and one focusing on clinician attitudes</td>
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<td>Dr Fiona Wood</td>
<td>Cardiff University</td>
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<td><strong>Out of Hospital Cardiac Arrest registry</strong></td>
<td>This national collaborative project hosted at the University of Warwick Clinical trials unit on behalf of the National Ambulance Service Medical Directors. The project has been funded by BHF and RCUK with the aims of establishing the epidemiology and outcome of OHCA, exploring sources of variation in outcomes and pushing for quality improvements and research for OHCA patients in the UK</td>
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<tr>
<td>Prof Gavin Perkins</td>
<td>Warwick University</td>
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<tr>
<td>Resuscitation Council (UK), British Heart Foundation and University of Warwick</td>
<td>SJB-M is supported by a NIHR Clinical Doctoral Training Fellowship.</td>
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Appendix A

References


Recent relevant publications


Pre-hospital Assessment of the Role of Adrenaline: Measuring the Effectiveness of Drug administration In Cardiac arrest (PARAMEDIC-2): Trial protocol Sep 2016 · Resuscitation


