South Central Ambulance Service NHS Foundation Trust

Research Annual Report
Period: 4/2021 - 3/2023

Research Steering Group:

Helen Pocock, Senior Research Paramedic

Martina Brown, Research and Clinical Audit Manager

Prof Charles Deakin, Research Lead.

Research Annual report 4/2021-3/2023

Contents

1. Introduction

The years 2021-23 have been a period of adjustment for South Central Ambulance Service NHS Foundation Trust, (SCAS). As the NHS starts to resume business as usual following

the COVID-19 pandemic, we can reflect on the challenges encountered and learning taken as we contributed to the national COVID-19 research agenda. During this time, and beyond, we have offered patients of all ages and clinical disposition and staff of all grades the opportunity engage, participate and enroll in research projects of local, national and global significance.

This Annual Report outlines the context and mechanisms that support the delivery of high-quality research in SCAS. In 2018 we developed a *Research Strategy* guiding our journey towards maximising the research capacity and capability of the Trust. The aims were aligned with the Trust's commitment to research as outlined in the SCAS *Clinical Strategy*. As we prepare to revise this Strategy for the coming years our vision remains unchanged: we aim to offer every service-user and staff member the opportunity to comment and contribute to research. In striving to fulfil these aims, SCAS continues to contribute to the vision of a research-led and evidence-based NHS as set out in the government's health research strategy *Best Research for Best Health*. This report charts our progress within this context and showcases some of the exceptional research activities undertaken in the last 24 months.

The Research and Development (R&D) functions at SCAS are carried out by a small core team consisting of a Research Lead, Research & Clinical Audit Manager, Senior Research Paramedic, Research Paramedics and Nurses and a Research Administrator. The entire research team supports hands-on the capacity and capability of the trust to deliver individual trials. We have a dedicated area for Research on the South Central Ambulance Service NHS Foundation Trust website, which can be accessed at: Research | South Central Ambulance Service NHS Foundation Trust (scas.nhs.uk) , and internal website for staff only.

Much of our core research funding is provided centrally by the National Institute of Health Research (NIHR), distributed by the Wessex Clinical Research Network (CRN). While our research activity is reported through CRN Wessex, we are also additionally supported by the Thames Valley South Midlands CRN as SCAS is geographically spread across two CRN regions. The team is also supported by funding from the Department for Health and Social Care as Research Capability Funding, and NIHR educational and development grants.

In general, research projects are funded (financially) and sponsored (controlled by) organisations that are commercial (such as pharma industry) or non-commercial (such as charities, NIHR, universities). When our trust commits to work on a project, we receive funding to support its safe delivery. This funding generally covers the cost of equipment, medication, workforce and supporting teams engaged in the project. The non-commercial sponsors often receive funding as grant awards from highly competitive peer-reviewed

competitions or calls that scrutinise many angles of the project such as its achievable aims, proposed processing and likelihood of generating high quality data that would be of public benefit.

Many of our registrant staff were redeployed to frontline clinical duties during periods of particularly high service demand during 2020 -- 2022. During this time our team was severely depleted, but we were still able to continue our engagement with the NIHR Urgent Public Health studies - the PRINCIPLE trial (IRAS 281958) and RECAP study (IRAS 283024) - as well as our non-COVID projects that had got underway in the preceding months.

From 4/ 2021 – 3/2023, SCAS enrolled 2747 service users and staff into NIHR portfolio research projects

1.1 Completed COVID-19 studies

- **Remote COVID-19 Assessment in primary care (RECAP) (IRAS 281958)**

The RECAP study developed a tool to assist primary care providers in the identification of those COVID-19 patients at risk of becoming severely ill. This enabled the rapid escalation of their treatment and increased the chances of better outcomes. The published paper is available in MedRxiv: Remote Covid Assessment in Primary Care (RECAP) risk prediction tool: derivation and real-world validation studies | medRxiv

- **Platform Randomised trial of interventions against covid-19 in older people (PRINCIPLE)** (IRAS 283024)

The PRINCIPLE trial assessed the effectiveness of various medications in reducing the need for hospital admission or death. The trial included patients aged 50 years or older with serious comorbidity, and aged 65 years or older with or without comorbidity and suspected COVID-19 infection during time of prevalent COVID-19 infection. The trial used a novel multi-platform model for the evaluation of several medications. Numerous papers were accepted by highly respected journals, and are available on the study's website https://www.principletrial.org/results

- **The United Kingdom Research study into ethnicity and COVID-19 outcomes in healthcare workers (UK-REACH) (IRAS 288316)**

This study aimed to provide novel evidence on COVID-19 outcomes among ethnic minority healthcare workers. This would inform the development of risk reduction and support programmes through increased understanding of risk as well physical and mental health outcomes. Ultimately, the aim is to reduce health inequalities and improve the long-term health outcomes of healthcare workers. Numerous papers were accepted by highly respected journals, and are available here: UK-REACH Study Collaborative Group[Corporate Author] - Search Results - PubMed (nih.gov)

1.2 Completed studies (non-COVID)

- **Paramedic decision making during out of hospital cardiac arrest 2. A mixed-methods study (REACT2) (IRAS 317321)**

The aim of this survey study was to explore, describe and understand how paramedics make decisions regarding the commencement of resuscitation efforts. The collected data provided an understanding of how these decisions are made and the trade-offs paramedics accept in these decisions.

- **Community First Responders'; role in the current and future rural health and care workforce (IRAS: 277205)**

The study aimed to explore real-world practice of Community First Responders and their contribution to prehospital emergency care. The published paper is available here: https://sjtrem.biomedcentral.com/articles/10.1186/s13049-023-01071-3

- **A mixed-methods study of female ambulance staff experiences of the menopause transition (CESSATION) (IRAS 295273)**

This study explored the current menopause guidance, policies and support offered by UK ambulance services. This helped to understand the work and personal impacts of the menopause on female ambulance staff and identify service developments and interventions that may best support female ambulance staff during this transition. The published paper is available here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8669643/

- **Prehospital optimal shock energy for defibrillation (POSED) (IRAS 277693)**

This feasibility study aims to establish which defibrillation energy is the most effective in treating out-of-hospital cardiac arrest.

1.3 Ongoing studies (non-COVID)

- **Pre-hospital randomised trial of medication route in out-of-hospital cardiac arrest (PARAMEDIC-3) (IRAS 298182)**

This trial is assessing the most effective way to treat out of hospital cardiac arrest patients by giving resuscitation medication either directly into the bloodstream (intravenous, I.V) or into a bone (intra-osseous, I.O). Answering this question will help to improve future outcomes.

- **Clinical randomisation of an anti-fibrinolytic in symptomatic mild head injury in older adults (CRASH-4) (IRAS 283157)**

CRASH-4 is seeking reliable evidence about the effects of early intramuscular tranexamic acid medication on intracranial haemorrhage, disability, death, and dementia in older adults with symptomatic mild head injury. SCAS has reached more patients than any other research site in the UK.

- **A Phase IIIb r Randomized open-label study of nirsevimab (versus no intervention) in preventing hospitalizations due to respiratory syncytial virus in infants (HARMONIE) (IRAS 1005180)**

The study determines the efficacy and safety of a single intramuscular dose of Nirsevimab, compared to no intervention, for the prevention of hospitalisations due to lower respiratory tract infection caused by confirmed Respiratory Syncytial Virus (RSV). The study enrolled infants under 12 months of age who are not eligible to receive Palivizumab. Using our unique research cars model of study delivery, SCAS has provided vaccinations to 70 patients in this project, who would not otherwise have been able to access this treatment.

- **Randomised control trial to understand whether prescribing choice for inhalers is influenced by knowledge of the CARBON footprint (REDUCE CARBON) (IRAS 285768)**

The study is looking to explore prescribing behaviours surrounding inhaler selection and what information, including knowledge of the carbon footprint, may influence this choice.

2. Accepting projects at SCAS and ongoing research governance

SCAS adheres to the principles of good practice in management and delivery of research as set out in the UK Policy Framework for Health & Social Care Research (2017). The Health Research Authority (HRA), an arm's length body of the Department for Health and Social Care, is the body responsible for reviewing and approving research projects conducted in the NHS. Through application to the HRA, researchers can seek all regulatory reviews and approvals, such as independent ethical review of projects by NHS Research Ethics Committees, including the Confidentiality Advisory Group.

The prospective academics/researchers and principal investigators, clinical research networks, and pharma organisations approach SCAS teams and leaders to consider collaboration and delivery on their projects. It is the SCAS Research team who organises and facilitates the assessment of the Trust's capacity and capability to deliver the project. Following this assessment, the project is then reviewed and approved by two SCAS committees which include the research Subject Matter Experts (SME) within the Research Steering Group (RSG) and trust clinical and operational leaders within the Clinical Review Group (CRG). The flow chart in Figure 1 summarises this internal process.

The SCAS research team provides ongoing research governance and SME oversight to any research project accepted via the Research Steering Group. This group streamlined the entire governance process and reduced the time it takes to set up safe, high-quality research projects in the Trust. The RSG built and expanded the infrastructure of the research team in the most challenging times during the global pandemic. The team has been working with the trust leadership to work on the staff retention strategies, considering and evaluating the most effective use of secondments, termed, permanent and bank contracts. This makes the research function within the trust responsive to need whilst providing short and long term opportunities to staff members wishing to further their research education, skills and experience.

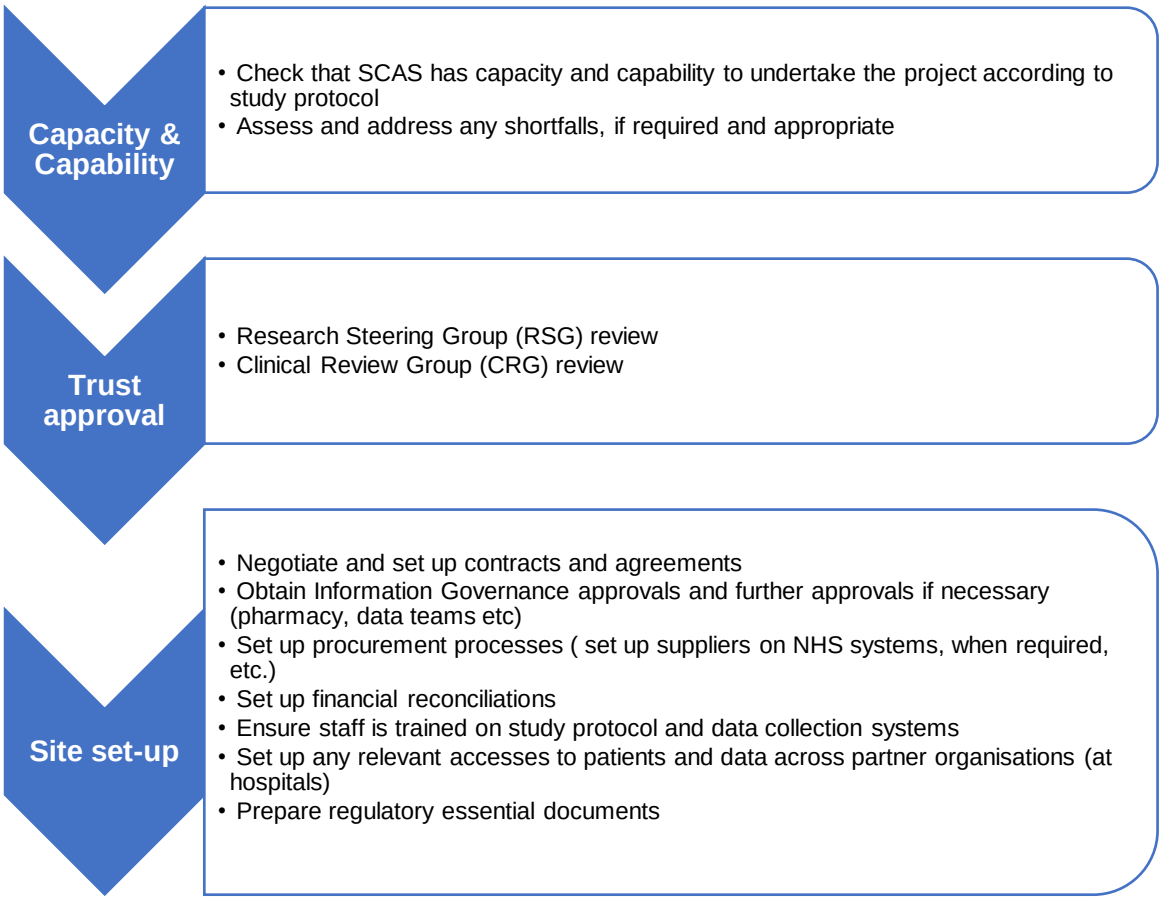

Figure 1: Flow chart of SCAS' internal research approval process.

One of the aims of the Research Strategy 2018-23 was to forge stronger links with other internal trust departments. The research team is now more closely aligned, for shared working, to the frontline clinicians and operational leaders, clinical audit team, the 999 emergency dispatch centre (EOC), business analysts, information governance, pharmacy, procurement and finance teams and the trust board. Whilst maintaining separate functions day-to-day, these teams are now conjoined under and works under instructions of a single research SME manager. This provides us with opportunities to inform research projects with audit and vice versa. For example, in preparation for the POSED study an audit of call volumes was undertaken to identify which area of the trust was likely to be most suitable for successful delivery of the study. The audit team has been expanded to include a part-time data clerk. This built capacity and resilience into the team.

With this inter- departmental working in place the RSG team are now more able to seek and take up opportunities for further research projects. We are pleased to report an increase in turnover from £140k to £500K in the last financial year alone.

2.1 Innovation: ‘Research car’ initiative

In 2020-21 we noticed that the huge demand on ambulance service resources was having an impact on the trust ability to offer patients the opportunity to be enrolled in clinical research. Ambulance delays in Category 3 (lower priority) responses meant that paramedics could not get to patients within the time-sensitive window for administration of trial medication. We introduced a dedicated 'Research car', a rapid response vehicle staffed by a research paramedic. This small fleet took over research enrolments as a pilot scheme and the research cars attended both ‘cases of research interest’ and Business as Usual (BAU) incidents. The pilot initiative was co-sponsored by the Wessex and TVSM Clinical Research Networks (CRNs) and the Clinical Randomisation of an Anti-fibrinolytic in Symptomatic mild Head injury (CRASH-4) trial research Sponsor, and we are delighted to continue the initiative beyond the pilot.

We now operate a fleet of 6 rapid response vehicles. The fleet has effectively increased the number of patients who could be offered investigative trial medication (CRASH4 and HARMONIE trials) or a procedure (PARAMEDIC 3 and POSED trials) within a tight randomisation enrolment window in times of extreme service pressures. As well as its research function, the fleet also contributes to addressing and preventing BAU ambulance response delays. The funding received has enabled us to purchase essential equipment such as laptops, electronic patient record (ePR) devices, ambulance radios, specific resuscitation equipment, ambient and cool storage for research medication on board of a vehicle and outside. This equipment and resources are shared with the Operational teams when required in benefit of ongoing research. The research paramedic workforce has successfully increased research engagement of the trust workforce and continues to promote a research culture via the 'research advocates' initiative Trust wide.

3. Developing a skilled workforce

Research is increasingly seen as part of the paramedic career structure. Some of our Research Paramedics stay with the team whilst others take their research experience into other avenues. Previous post-holders have gone on to a variety of clinical, educational and managerial posts including Specialist Paramedic, Clinical Team Educator, University Lecturer and Clinical Education Manager. Taking research experience into these new roles will benefit the Trust and the NHS in the long term; our paramedic students and front line clinicians will benefit from increased research awareness and the research capability of our clinical teams will increase.

In the last year we have expanded our core research team from six to ten. Our newly onboarded research nurses and paramedics bring knowledge and experience from primary care, ambulance frontline and university teaching faculty. All of our research team complete regular Good Clinical Practice (GCP) training and we ensure that all new members of staff undertake this training as part of their induction programme. Our research management team have in the last year achieved formal qualifications in UK GDPR and AGILE project management. Expanding knowledge in these areas not only improves the safeguarding of patient's rights, accuracy of the data reported and efficiency of data processing, it also allows the research team to comply with the trust information governance policies and embed data protection into all processes we design from the start of the study. This, in turn, results in overall time saving to the trust information governance team as our DPIA assessments require shorter review and approval. Our team now enacts the principles of AGILE project management. This has transformed the way that we work, increased efficiency and improved communications throughout the team. In the coming year all core team members will also be studying to achieve a proficiency in Microsoft Excel .

Staff requiring a temporary period of working on alternative duties have been welcomed to the team and have supported our delivery of national and local studies. All temporary team members are inducted into the team and allocated specific tasks depending on need and existing skills. Our temporary staff have reported high satisfaction levels during their time with us and return to their substantive roles with new knowledge and experience which also enhanced their CV and annual professional development review discussions with their team leaders.

We are keen to develop those with whom we will work in future. We provide placement opportunities to both medical and paramedic students. Students shadow research paramedics as they go about their daily tasks, usually working on the research cars or collect research data. This is a unique opportunity for the students to witness pre-hospital research on scene and from behind the desk. The feedback from this initiative has been phenomenally positive, and we now work with universities to formally embed this opportunity in student placements especially as the new HCPC Standards of Proficiency (2023) require all registrants to engage service users in appropriate research. We anticipate that the experience will lead to new research opportunities for the ambulance service in the future as these students become qualified and want to develop research projects of their own.

4. Developing collaborations

4.1 Local Clinical Research Network (CRN)

We are represented on the following local committees:

- CRN Wessex Senior Research Nurses/Allied Health Professionals Group
- CRN Wessex Research Study Delivery Group
- CRN Wessex Finance Managers Group
- CRN Wessex Research Hub Working Group
- CRN Thames Valley & South Midlands Trauma and Emergencies Specialty Group

Membership of these groups has been extremely useful for developing relationships with our local acute trusts and promoting out-of-hospital research. During the past year, the meetings have continued via an online platform. Additionally, in order to ensure timely and robust vaccines research, the CRN has hosted weekly regional meetings. Such meetings have enabled the various organisations to unitedly support the commercial COVID-19 vaccine trials across the Wessex region. Latterly, they have facilitated the co-ordinated resumption of the pre-pandemic trials.

Building on the outstanding work of the vaccine hubs across the Wessex region, the CRN aims to expand the model of research hubs during the coming years. SCAS is proud to collaborate with our local acute hospital trusts in the delivery of a range of high-quality studies serving our local population. This is an example of cross-boundary joined-up working, almost unheard of pre-pandemic but now becoming a vision for a sustainable future model of working.

4.2 National Ambulance Research Steering Group

Membership of this group, which meets bi-monthly, keeps us linked with the other ambulance services. The group welcomes researchers bringing new research ideas for feasibility discussions at an early stage in their projects. This has been beneficial to all stakeholders and increased the quality of the projects and optimised their potential to recruit to time and target. One of the strengths of this group is their ability to respond to national developments with a single voice, such as a project encouraging the development of paramedics to become Principal Investigators.

4.3 Local collaborations

Whilst it is important for the trust to contribute to large national research projects, it is also important that we remain responsive to local needs. Some of our local collaborations are designed to specifically benefit local patients. Our work with the Universities of Portsmouth and Southampton exploring care and outcomes of people with dementia is an example of such focus. This series of projects has previously audited the care of people with dementia, explored possible predictors of whether a patient is conveyed to hospital or cared for at home and surveyed frontline staff regarding their recording of suspected dementia on the patient record. This year we have been awarded additional funding to implement a 'dementia tab' on our clinical record, audit its use and survey staff on their perceived usefulness of the tab. The project will continue next year with geospatial mapping of calls to patients with dementia-type needs. These projects will help us to target and deliver the most appropriate care in the most appropriate setting.

We are also supporting internal and external students, undertaking health care educational pathways (BSc, MSc, PhD) who wish to undertake research projects with us or within our trust, to provide them with an introduction to research and support them with mutually beneficial projects.

4.4 National collaboration

We are delighted to play an important part in some of the most ground-breaking national out-of-hospital studies in recent years. In addition to being involved in both the design and delivery of the high-profile PARAMEDIC3 and CRASH4 trials, we have also engaged in other significant projects at an early stage, helping to shape trial delivery as they are expanded nationally. We have had significant involvement in the implementation of the following projects that are currently open in SCAS.

To increase our visibility and recognisability we have added 'Clinical Research team' epaulettes and badges to our operational uniforms. These are generally worn in an academic context when engaging with stakeholders, for example at meetings and conferences.

5. Aligning research with practice

Equally important as taking part in research is the commitment to translate research findings into clinical practice. Two members of our research team hold voluntary positions with the International Liaison Committee on Resuscitation, the body providing evidence evaluation

and recommendation to the global resuscitation councils. Our research lead Professor Charles Deakin's ongoing work with the European Resuscitation Council and Resuscitation Council (UK) has also supported the revision to the 2021 resuscitation guidelines.

We have been engaged with a number of projects focussing on patient treatments and interventions as well as studies exploring staff experiences. All have the overall goal of supporting our staff to improve patient care as well as establishing SCAS as the employer of choice.

5.1 Audits near completion with potential to become a research project

- **Resus pads**

Resuscitation guidelines place substantial importance on the early defibrillation of patients in cardiac arrest. An incorrectly placed set of pads is likely to result in failed defibrillation. Little evidence is available to determine whether pre-hospital emergency service personnel apply defibrillator electrodes in the correct position. We audited placement of defibrillator pads positioned by frontline emergency personnel on a unisex adult manikin torso in presumed cardiac arrest. Following the pad placement, the pad's centre and its orientation were measured against recommended positions described in ERC guidelines. The abstract of this project was accepted by the 99 EMS conference in 2023.

- **Bystander availability and Automated External Defibrillator (AED) acceptability during out-of-hospital cardiac arrest (BYSTANDER)**

By listening to cardiac arrest 999 calls we aim to identify how a bystander responds if they are asked to fetch an Automated External Defibrillator (AED). We will predict how often an AED could be used and the reasons why people might have difficulty fetching or using an AED. This will help researchers to plan AED deployment and help target future public education campaigns.

- **Optimizing outcomes after out-of-hospital cardiac arrest with innovative approaches to public-access defibrillation: A scientific statement from the International Liaison Committee on Resuscitation**

Recommendations from SCAS research undertaken two years ago has now been adopted by ILCOR as part of their international guidelines advising on standards for optimal marking and visibility for public access defibrillators.

6. Disseminating research findings

This year we have increased our visibility within the Trust by establishing our own community within 'Yammer', our internal social media platform. Members of the team regularly Yammer to other members of the Trust about ongoing and planned research projects. Opportunities to take part in studies or become a research advocate are also advertised on this SharePoint.

We have an area on the SCAS website dedicated to research, which can be accessed here. This is where our Research strategy and Annual report are posted. Also located here is information for patients regarding the use of their data in research and information for researchers about how to obtain approval for their research projects to be conducted in the trust. All NHS trusts are required to publish their research activity quarterly on the NIHR platform and a link to our performance data can be found on our webpage. We post information about our ongoing studies and summaries of the results of completed projects with links to research papers where applicable.

Despite being redeployed to frontline clinical practice during this period, we have continued to communicate our research to our public and peers. SCAS staff produced 25 publications in peer-reviewed journals and made 34 conference/meeting presentations. These are listed in appendices A & B.

7. Sustainability

During this period, we have continued to explore new ways of working and bring research projects into areas of the Trust that were previously underrepresented in research. One of the consequences of the pandemic is the accelerated move towards online education and training. This can be extremely beneficial for busy clinicians wanting to engage in learning activities that might traditionally have necessitated a journey to attend. Building a clear, shared understanding of what is necessary for successful research is so important to build sustainable activity.

A Research Steering Group and associated Terms of Reference have been developed to strengthen and streamline the management of our research projects. Each research project brings funding in order that the activity does not detrimentally impact on the other important day-to-day functions of the Trust. With the ever-increasing number of projects, budgeting and spending have been reorganised to allow smooth, trackable cash-flow to sustain the

various projects across their life cycle. We have engaged research advocates at our ambulance stations to help to promote research and assist with delivery of projects. This team of motivated individuals help us to track research resources in real time so that we know when to re-stock. They remind staff to complete training on trial procedures and signpost colleagues to research opportunities such as online webinars. In return, we provide further opportunities for development which can be evidenced in their professional portfolios.

We continue to support non-research team staff with their projects, from the early stages of development to dissemination of research findings, often via poster presentation at conference.

To sustain and grow our research activity we need to promote the work of the team both internally and externally. Now that we are starting to return to face-to-face interaction, we have developed our own unique 'business cards', banner pens highlighting our capabilities and reach for potential external collaborators and our links and resources for our future internal collaborators.

8. Future plans

In the coming financial year, we intend to continue our involvement in several large-scale trials of national importance, predicted to involve thousands of patients. We will expand our portfolio to include new commercial and non-commercial studies, including home-grown projects that have been in development this year. We will grow our team in response to need, finding new and innovative ways of working that give staff flexibility and scope to take part in research alongside their current roles. We will increase the number of staff trained to deliver research to patients on the national portfolio thereby giving patients a greater number of opportunities to take part in research.

We will further integrate the research and clinical audit teams and build additional resilience into the team. Although funded separately, our future vision is that audit and research will sit alongside each other and will sometimes inform each other. Both share the common goal of improving patient care.

We are keen to retain the enthusiasm for and build on the successes of UK healthcare research of the past 24 months. We are in a stronger position now than ever before to build our research capacity and hence improve our care for all of our patients, service users and staff.

8.1 Research projects currently in set-up

- **EarLy Surveillance for Auto-immune type 1 diabetes (ELSA)**

Early detection of type 1 diabetes mellitus from the general population will allow insulin treatment to be started sooner, avoid type 1 diabetes mellitus being diagnosed as an emergency, improve glycaemic control, and will identify children who can be offered novel clinical trials of therapies for diabetes prevention. Enrolment will be offered by Research paramedics/nurses via schools and community events.

- **Spinal Immobilisation Study (SIS)**

This is multi-centre, open-label, pragmatic, pre-hospital, non-inferiority randomised controlled trial with health economic evaluation to determine the effectiveness of immobilisation regimes involving movement minimisation and triple immobilisation (current NHS practice) in patients with cervical spine injury recruited in a pre-hospital setting. Study will be offered trust-wide by all registrants.

- **Geospatial mapping of emergency calls by older people, with a focus on people living with dementia, in the South Central region**

This multidisciplinary, multiagency project aims to extract routinely collected data to produce geospatial maps highlighting areas of highest demand or where Community First Responders may be most needed. Stakeholder meetings will be held to identify priorities for future research.

Appendix A - Publications

2021

Handyside B, Pocock H, Deakin CD, Rodriguez-Bachiller I. (2021) An Exploration of the facilitators and barriers to paramedics' assessment and treatment of pain in PAeditaric patients following Trauma (EX-PAT). *British Paramedic Journal*, 6 (2): 10-18. Doi: https://doi.org/10.29045/14784726.2021.9.6.2.10.

Jadzinski P, **Pocock H**, **Lofthouse-Jones C, King P, Taylor S**, **England E,** Cavalier J, Fogg C. (2021) Improving recording and reporting of dementia and frailty via electronic patient record by ambulance staff in a single service (IDEAS). *British Paramedic Journal*, 6(3): 31-40. Doi: https://doi.org/10.29045/14784726.2021.12.6.3.31.

Ji C, Haywood KL, Quinn T, Nolan J, **Deakin CD,** Scomparin C, Lall R, Gates S, Long J, Regan S, Fothergill R, Pocock H, Rees N, O'Shea L, Perkins GD. Long term outcomes of participants in the PARAMEDIC2 randomised trial of adrenaline in out-of-hospital cardiac arrest. Resuscitation 2021; 160: 84-93. doi: https://10.1016/j.resuscitation.2021.01.019

Lofthouse-Jones C, King P, Pocock H, Ramsay M, Jadzinski P, **England E, Taylor S**, Cavalier J, Fogg C. (2021) Reducing ambulance conveyance for older people with and without dementia: evidence of the role of social care from a regional, year-long service evaluation using retrospective routine data. *British Paramedic Journal*, 6(3): 58-69. Doi: https://doi.org/10.29045/14784726.2021.12.6.3.58.

Perkins GD, Ji C, Achana F, **Black JJM**, Crawford J, de Paeztron A, **Deakin CD**, Docherty M, Finn J, Fothergill RT, Gates S, Gunson I, Han K, Hennings S, Horton J, Khan K, Lamb S, Long J, Miller J, Moore F, Nonan J, O'Shea L, Petrous S, **Pocock H**, Quinn T, Rees N, Regan S, Rosser A, Scomparin C, Slowther A, Lall R. (2021) Adrenaline to improve survival in out-of-hospital cardiac arrest: the PARAMEDIC2 RCT. *Health Technology Assessment*; 25(25). Published April 2021. Doi: https://doi.org/10.3310/hta25250.

Soar J, Bottiger BW, Carli P, Couper K, **Deakin CD**, Djavf T, Lott C, Olasveengen T, Paal P, Pellis T, D. Perkins GD, Sandroni C, Nolan JP. European Resuscitation Council Guidelines 2021: Adult advanced life support. *Resuscitation* 2021; 161:115-151. https://doi.org/10.1016/j.resuscitation.2021.02.010.

Smith K, Brooks W, Challiner J, Povey E. (2021) Quality assurance of remote clinical assessments in the NHS. *Lancet*, 398 (10315): 1962. Doi: https://doi.org/10.1016/S0140-6736(21)02328-X.

Soar J, Nolan JP, Andersen LW, Böttiger BW, Couper K, **Deakin CD**, Drennan I, Hirsch KG, Hsu CH, Nicholson TC, O'Neil BJ, Paiva EF, Parr MJ, Reynolds JC, Sandroni C, Wang TL, Callaway CW, Donnino MW, Granfeldt A, Holmberg MJ, Lavonas EJ, Morrison LJ, Nation K, Neumar RW, Nikolaou N, Skrifvars MB, Welsford M, Morley PT, Berg KM Temperature Management in Adult Cardiac Arrest Consensus on Science with Treatment Recommendations [Internet] Brussels, Belgium: International Liaison Committee on Resuscitation (ILCOR) Advanced Life Support Task Force, August 2021. Available from: http://ilcor.org

Wyckoff MH, Singletary EM, Soar J, Olasveengen T, Greif R, Liley HG, Zideman D, Bhanji F, Andersen L, Avis SR, Aziz K, Bendall JC, Berry DC, Borra V, Böttiger BW, Bradley R, Bray JE, Breckwoldt J, Carlson JN, Cassan P, Castrén M, Chang W, Charlton NP, Cheng A, Chung SP, Considine J, Costa-Nobre DT, Couper K, Dainty KN, Davis PG, de Almeida MF, de Caen A, Paiva EF, **Deakin CD**, Djärv T, Douma MJ, Drennan IR, Duff JP, Eastwood KJ, Epstein JL, Escalante R, Fabres JG, Fawke J, Finn JC, Foglia EE, Folke F, Freeman K, Gilfoyle E, Goolsby CA, Grove A, Guinsburg R, Hatanaka T, Hazinski, MF, Heriot GS, Hirsch KG, Holmberg MJ, Hosono S, Hsieh M, Hung K, Hsu CH, Ikeyama T, Isayama T, Kapadia VS, Kawakami M, Kim H, Kloeck DA, Kudenchuk PJ, Lagina AT, Lauridsen, KG, Lavonas EJ, Lockey AS, Hansen CM, Markenson D, Matsuyama T, McKinlay CJ, Mehrabian A, Merchant RM, Meyran D, Morley PT, Morrison LJ, Nation KJ, Nemeth M, Neumar RW, Nicholson T, Niermeyer S, Nikolaou N, Nishiyama C, O'Neil BJ, Orkin AM, Osemeke O, Parr MJ, Patocka C, Pellegrino JL, Perkins GD, Perlman JM, Rabi Y, Reynolds JC, Ristagno G, Roehr CC, Sakamoto T, Sandroni C, Sawyer T, Schmölzer GM, Schnaubelt S, Semeraro F, Skrifvars MB, Smith CM, Smyth MA, Soll RF, Sugiura T, Taylor-Phillips S, Trevisanuto D, Vaillancourt C, Wang T, Weiner GM, Welsford M, Wigginton J, Wyllie JP, Joyce Yeung, PhD, RN; Jerry P. Nolan, Katherine M. Berg, MD. 2021 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations Summary From the Basic Life Support; Advanced Life Support; Neonatal Life Support; Education, Implementation, and Teams; First Aid Task Forces; and the COVID-19 Working Group. *Resuscitation* 2021 Dec;169:229-311. DOI: https://doi.org/10.1016/j.resuscitation.2021.10.040

2022

Brooks SC, Clegg GR, Bray J, **Deakin CD**, Perkins GD, Ringh M, Smith CM, Link MS, Merchant RM, Pezo-Morales J, Parr M, Morrison LJ, Wang T, Koster RW, Ong M, on behalf of the International

Liaison Committee on Resuscitation. Optimizing outcomes after out-of-hospital cardiac arrest with innovative approaches to public-access defibrillation: A scientific statement from the International Liaison Committee on Resuscitation. Resuscitation 2022 172; 204-228. https://doi.org/10.1016/j.resuscitation.2021.11.032

Brooks SC, Clegg GR, Bray J, **Deakin CD**, Perkins GD, Ringh M, Smith CM, Link MS, Merchant RM, Pezo-Morales J, Parr M, Morrison LJ, Wang T, Koster RW, Ong M, on behalf of the International Liaison Committee on Resuscitation. Optimizing outcomes after out-of-hospital cardiac arrest with innovative approaches to public-access defibrillation: A scientific statement from the International Liaison Committee on Resuscitation. Circulation. 2022;145:e776–e801. https://doi.org/10.1161/CIR.0000000000001013

Brown T, Perkins GD, Smith CM, **Deakin CD,** Fothergill R. (2022) Are there disparities in the location of automated external defibrillators in England? *Resuscitation*, 170: 28-35. Doi: https://doi.org/10.1016/j.resusciation.2021.10.037.

Dove A, Pointeer L, Couper K, Perkins GD, **Pocock H.** (2022) Variability in approach to informing the relatives of non-surviving participants in cardiac arrest research: a questionnaire study: *Resuscitation*, 175(S1):S73.

Haywood KL, Ji C, Quinn T, Nolan JP, Deakin CD, Scomparin C, Lall R, Gates S, Long J, Regan S, Fothergill RT, **Pocock H**, Rees N, O'Shea L, Perkins GD. (2021) Long term outcomes of participants in the PARAMEDIC2 randomised trial of adrenaline in out-of-hospital cardiac arrest. *Resuscitation*, 160: 84-9.

Onen B, Fawcett N, **Daniel S**, Samm E, Lasserson D, Bowen J, Singh S. (2022) Service evaluation of the impact of direct ambulance calls from paramedics to the ambulatory assessment unit in the John Radcliffe hospital, Oxford. *Future Healthcare Journal*. Doi: https://doi.org/10.7861/fhj.9-2-s14.

Orsi A, Watson A, Wijegoonewardene N, Botan V, Lloyd D, **Dunbar N**, Asghar Z, Siriwardena AN. (2022) Perceptions and experiences of medical student first responders: a mixed methods study. *BMC Medical Education,* 22: 721. Doi: https://doi.org/10.1186/s12909-022-03791-z

Pocock H, Deakin CD, Lall R, Couper K, Price J, Perkins GD. (2022) To inform or not? A qualitative evaluation of patients and public opinions on providing information about research participation following out of hospital cardiac arrest. *Resuscitation*, 175: S72. Doi: https://doi.org/10.1016/S0300-9572(22)00510-X.

Pocock H, Deakin CD, Lall R, Michelet F, Contreras A, **Ainsworth-Smith M, King P**, Devrell A, Smith DE, Perkins GD. (2022) Protocol for a cluster randomised controlled feasibility study of Prehospital Optimal Shock Energy for Defibrillation (POSED). *Resuscitation Plus,* 12*.* Doi: https://doi.org/10.1016/j.resplu.2022.100310.

Pocock H, Deakin CD, Lall R, Perkins GD. (2022) Could we identify the Prehospital Optimal Shock Energy for Defibrillation? Answering the question that is POSED. *Emergency Medicine Journal*, 39:e5.

Pocock H, **Deakin CD**, Lall R, Perkins GD (2022) Feasibility randomised controlled trial of optimal shock energy for defibrillation. *Resuscitation*, 175(S1): S12.

Pocock H, **Deakin CD,** Lall R, Smith CM, Perkins GD. (2022) Effectiveness of alternative shock strategies for out-of-hospital cardiac arrest: a systematic review. *Resuscitation Plus*, 10. Doi: https://doi.org/10.1016/jresplu.2022.100232.

Pocock H, Deakin CD, Lall R, Smith CM, Perkins GD. (2022) Systematic review of shock strategies for out-of-hospital cardiac arrest. *Resuscitation*, **175** (S1): S73.

Vadeyar S, Buckle A, Hooper A, Booth S, **Deakin CD**, Fothergill R, Ji C, Nolan J, Perkins GD, Couper K on behalf of the OHCAO collaborators. (2022) Increasing use of intraosseous access at out-of-hospital cardiac arrest: a registry-based cohort study. *Resuscitation*, 175 (1): S79. Doi: https://doi.org/10.1016/S0300-9572(22)00527-5.

Wyckoff MH, Singletary EM, Soar J, Olasveengen T, Greif R, Liley HG, Zideman D, Bhanji F, Andersen L, Avis SR, Aziz K, Bendall JC, Berry DC, Borra V, Böttiger BW, Bradley R, Bray JE, Breckwoldt J, Carlson JN, Cassan P, Castrén M, Chang W, Charlton NP, Cheng A, Chung SP, Considine J, Costa-Nobre DT, Couper K, Dainty KN, Davis PG, de Almeida MF, de Caen A, Paiva EF, **Deakin CD**, Djärv T, Douma MJ, Drennan IR, Duff JP, Eastwood KJ, Epstein JL, Escalante R, Fabres JG, Fawke J, Finn JC, Foglia EE, Folke F, Freeman K, Gilfoyle E, Goolsby CA, Grove A, Guinsburg R, Hatanaka T, Hazinski, MF, Heriot GS,

Hirsch KG, Holmberg MJ, Hosono S, Hsieh M, Hung K, Hsu CH, Ikeyama T, Isayama T, Kapadia VS, Kawakami M, Kim H, Kloeck DA, Kudenchuk PJ, Lagina AT, Lauridsen, KG, Lavonas EJ, Lockey AS, Hansen CM, Markenson D, Matsuyama T, McKinlay CJ, Mehrabian A, Merchant RM, Meyran D, Morley PT, Morrison LJ, Nation KJ, Nemeth M, Neumar RW, Nicholson T, Niermeyer S, Nikolaou N, Nishiyama C, O'Neil BJ, Orkin AM, Osemeke O, Parr MJ, Patocka C, Pellegrino JL, Perkins GD, Perlman JM, Rabi Y, Reynolds JC, Ristagno G, Roehr CC, Sakamoto T, Sandroni C, Sawyer T, Schmölzer GM, Schnaubelt S, Semeraro F, Skrifvars MB, Smith CM, Smyth MA, Soll RF, Sugiura T, Taylor-Phillips S, Trevisanuto D, Vaillancourt C, Wang T, Weiner GM, Welsford M, Wigginton J, Wyllie JP, Joyce Yeung, PhD, RN; Jerry P. Nolan, Katherine M. Berg, MD. 2021 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations Summary From the Basic Life Support; Advanced Life Support; Neonatal Life Support; Education, Implementation, and Teams; First Aid Task Forces; and the COVID-19 Working Group. Circulation. 2022;145:e645–e721. https://doi.org/10.1161/CIR.0000000000001017

Wyckoff M, Greif R, Morley P, Ng KC, Olasveengen T, Singletary E, Soar J, Cheng A, Drennan I, Liley H, Scholefield B, Smyth M, Welsford M, Zideman D, Acworth J, Aickin R, Andersen L, Atkins D, Berry D, Bhanji F, Bierens J, Couto TB, Skrifvars M, Borra V, Bottiger B, Bradley R, Bray J, Breckwoldt J, Callaway C, Carlson J, Cassan P, Castrén M, Chang WT, Charlton N, Chung SP, Considine J, Costa-Nobre D, Couper K, Dainty K, Davis P, de Almeida MF, De Caen A, Deakin CD, Djärv T, Donnino M, Douma M, Duff J, Dunne C, Eastwood K, El-Naggar W, Fabres J, Fawke J, Finn J, Foglia E, Folke F, Gilfoyle E, Goolsby G, Granfeldt A, Guerguerian AM, Guinsburg R, Hirsch K, Holmberg MJ, Hosono S, Hsieh MJ, Hsu C, Ikeyama T, Isayama T, Johnson N, Kapadia V, Kawakami M, Kim HS, Kleinman M, Kloeck D, Kudenchuk P, Lagina A, Lauridsen K, Lavonas E, Lee H, Lin Y, Lockey A, Maconochie I, Madar R, Hansen CM, Masterson S, Matsuyama T, McKinlay C, Meyran D, Morgan P, Morrison L, Nadkarni V, Nakwa F, Nation K, Nehme Z, Nemeth M, Neumar R, Nicholson T, Nikolaou N, Nishiyama C, Norii T, Nuthall G, O'Neil B, Ong G, Orkin A, Paiva E, Parr M, Patocka C, Pellegrino J, Perkins G, Perlman J, Rabi Y, Ramaswamy V, Reis A, Reynolds J, Ristagno G, Rodriguez-Nunez A, Roehr C, Ruediger M, SakamotoT, Sandroni C, Sawyer T, Schexnayder S, Schmölzer G, Schnaubelt S, Semeraro F, Smith C, Sugiura T, Tijssen J, Trevisanuto D, van de Voorde P, Wang TL, Weiner G, Wyllie J, Yang CW, Yeung J, Nolan J, and Berg K. 2022 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Pediatric Life Support; Neonatal Life Support; Education, Implementation, and Teams; and First Aid Task Forces. Resuscitation 2022; 181: 208-288. doi: 10.1016/j.resuscitation.2022.10.005

Appendix B – Presentations

2021

Ainsworth-Smith M. Covid@home and the introduction of pulse oximeters in the community. *SE Region AHSN February 2021(virtual)*

Ainsworth-Smith M. Covid Management for Patients who are non-conveyed to hospital. *National Ambulance Service Medical Directors. March 2021 (virtual)*

Ainsworth-Smith M. Dealing with Major Trauma in the Pre-Hospital Arena. *Wessex Critical Care Programme. March 2021 (virtual).*

Ainsworth-Smith M. The role of the ambulance service in dealing with Major Trauma. *British Orthopaedic Association (BOA) May 2021 (virtual)*

Ainsworth-Smith M. Electronic Patient Records – good or bad? *The Council of Ambulance Authorities, Australia September 2021 (virtual)*

Ainsworth-Smith M. Recognition of the Sick Patient in the out-of-hospital environment. *Managing deterioration Conference, Birmingham, October 2021*

Deakin CD. Controversies in Resuscitation. *Essex & Hertfordshire Air Ambulance study day. April 2021.*

Deakin CD. How to train the population in CPR provision. *British Cardiovascular Society Annual Meeting (Virtual). June 2021.*

Deakin CD. Improving cardiac arrest survival in the pre-hospital environment. *Air Ambulances UK – National Meeting (Virtual). November 2021.*

Deakin CD. Anaphylaxis Update. *Joint Royal Colleges Ambulance Liaison Committee. Annual Symposium (Virtual). November 2021.*

Deakin CD. Cardiac arrest 2021 guidelines update. *Joint Royal Colleges Ambulance Liaison Committee. Annual Symposium (Virtual). November 2021.*

Deakin CD. Defibrillation. *European Resuscitation Council Guidelines Conference 2021. Antwerp (Virtual). March 2021.*

Deakin CD. 2021 Resuscitation Guidelines. *Annual Conference Austrian Resuscitation Council. Innsbruck (via Zoom). April 2021.*

Deakin CD. Beta-Stressors, Vasopressors and Arrhythmia Suppressors: What Are Effective Drug Interventions in Resuscitation? *Take Heart America Annual EMS conference. San Antonio, USA. August 2021 (via Zoom).*

Deakin CD. 2021 European Resuscitation guidelines. *20th International Congress of the Polish Society of Anaesthesiology and Intensive Therapy. Krakow, Poland. August 2021 (via Zoom).*

Pocock H. Could we answer the question that is POSED? *Three-minute thesis competition, University of Warwick (virtual) (runner-up). June 2021.*

Pocock H. Prehospital Optimal Shock Energy for Defibrillation (POSED). *Australian Resuscitation Outcomes Consortium Symposium (virtual). October 2021.*

Pocock H. The real-world challenges of managing a trial in the ambulance setting. *Australasian College of Paramedics Talking Research webinar (virtual). November 2021.*

2022

Ainsworth-Smith M. IPC on the Frontline. *National IPC Conference. Birmingham, April 2022*

Ainsworth-Smith M. The Impact of COVID-19 on the ambulance service. *Thames Valley Research Conference, Reading, May 2022*

Ainsworth-Smith M. Recognition of Sepsis for Clinicians. *NHS Pathways, National Conference June 21st 2022 (virtual)*

Ainsworth-Smith M. Recognition of Sepsis for Non-Clinicians. *NHS Pathways, National Conference June 22nd 2022 (virtual)*

Ainsworth-Smith M. Managing Deterioration: Oximetry@home. *Managing deterioration Conference, Birmingham, Pre-recorded 31st August 2022. Delivery September 2022.*

Ainsworth-Smith M. The role of the ambulance service: *SCAS, NHS Graduate Management Course, Otterbourne 12th September 2022*

Ainsworth-Smith M. Trauma Networks 10 years on: Then and Now. *Wessex Trauma Network Conference, Southampton 27th September 2022*

Ainsworth-Smith M. Cardiac Arrest and Heart Attack. *Oxford University Hospital and SCAS joint event 18th October 2022*

Ainsworth-Smith M. The Platinum Tsunami. *CFR Conference at DeVere Wokefield 23rd October 2022*

Deakin CD. Improving survival from cardiac arrest in the pre-hospital environment. National HEMS Research & Audit Forum. Annual Symposium (Virtual). November 2022.

Pocock H. Could we identify the Prehospital Optimal Shock Energy for Defibrillation? Answering the question that is POSED. *999 EMS Research Forum conference (virtual). March 2022.*

Pocock H. To inform or not to inform? A qualitative evaluation of patient and public opinions on providing information about research participation following out-of-hospital cardiac arrest. *ERC Congress 2022, Antwerp, Belgium. June 2022.*

Pocock H. Systematic review of shock strategies for out-of-hospital cardiac arrest. *ERC Congress 2022, Antwerp, Belgium. June 2022.*

Pocock H. Variability in approach to informing the relatives of non-surviving participants in cardiac arrest research: a questionnaire study. *ERC Congress 2022, Antwerp, Belgium. June 2022.*

Pocock H. Feasibility randomised controlled trial of optimal shock energy for defibrillation. *ERC Congress 2022, Antwerp, Belgium. June 2022.*

2023

Ainsworth-Smith M. Cardiac Arrest: minutes matter. University Hospital Southampton and SCAS joint event 28th March 2023

Appendix C - Participant enrolment into research projects (April 2022- Feb 2023)