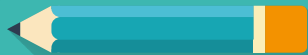


MEDICAL DIRECTORATE
EDUCATION RESEARCH AND INNOVATION
Annual Report 2019

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Contents

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Introduction

Following the publication of the inaugural Medical Directorate Education Research and Innovation Annual report in 2018, it was agreed to provide an annual update on ongoing or novel areas of research activity highlighting new evidence and outcomes of evaluation, with a commentary on any relevant impact assessment.

The Medical Directorate Research and Innovation Governance Board (MedRIG) continues to provide strategic leadership, but much of the ongoing activity occurs through active operational groups and collaboratives. These hubs of activity include SMERC (Scottish Medical Education Research Collaborative), SKIRC (Safety, Skills & Improvement Research Consortium) and a variety of collaborations across primary care, pharmacy and the Medical Directorate Workstreams.



The strategic vision of MedRIG is to achieve internationally-excellent, locally-relevant medical and healthcare education research and innovation.

The aim of this report is to build on what was reported last year: www.scotlanddeanery.nhs.scot/media/176644/medicaleducationresearchinnovationannualreport2018final.pdf.



Introduction

We have also kept the same general themes as last year :

Theme 1: Developing the Workforce

Chapter 1: Selection / Widening Access

Chapter 2: Career Decision Making

Chapter 3: Developing Staff



Theme 2: Developing the Clinical Learning Environment

Chapter 4: Factors that Affect the Clinical Learning Environment

Chapter 5: Building a Safety and Learning Culture



I am indebted to several individuals who continue to provide leadership across this activity and who have contributed significantly to the content of this second annual report, namely Professor Jen Cleland (SMERC Director), Professor Paul Bowie (SKIRC), Professor Jean Ker (SKIRC), Dr John McKay (SKIRC, Primary Care), Suzanne Stirling (Specialist Research Lead – Medical), Dr Judy Wakeling (Specialist Research Lead – Medical), Dr Ailsa Power (Pharmacy), Leon Zlotos (Pharmacy) and Professor Peter Johnston (Deputy Postgraduate Dean). I am also very grateful to Niall MacIntosh who has helped with the final production of this report and to the NES design Team who have created the Final Report.



Professor Rowan Parks
Deputy Medical Director and Chair of MedRIG

SMERC (Scottish Medical Education Research Collaborative)



SMERC was established in 2011 as a collaborative between NES and the five Scottish Medical Schools. It is core funded by NES and aims to conduct high quality and important medical education research in Scotland and beyond, build capacity within Scotland, and develop collaborations with leading international researchers.

SMERC has built a critical mass of experienced researchers and is developing emerging researchers who have a deep understanding of medical education and training, to understand and develop the new knowledge, skills and workplace behaviours essential for addressing current and future healthcare challenges.

SMERC activities include:

- The establishment and support of 15 PhD studentships, four of which are core funded by NES and the others are funded by competitively won external sources, including the only Intercollegiate Surgical Curriculum Programme (ISCP) Fellow in the UK. This fellow is examining the predictive validity of surgical assessments and selection procedures..

At the time of writing, all four NES PhD studentships are on track with one successfully completed, two where the students are addressing amendments before final submission, and one due to submit by the end of 2018. Supervision is provided from medical schools, NES, other NHS authorities, and key international collaborators. These doctoral students give us the greatest medical education research capacity in the UK, and build sustainability in terms of developing a breadth of understanding and knowledge of medical education research across Scotland.

- Support of medical students, trainees and research fellows in developing skills and knowledge via Summer Studentship Schemes, B Med Sci studentships, an Academic Foundation Programme in Medical Education, and by providing teaching in research to Foundation Doctors. One of the 2017-2018 students supervised by SMERC staff won the Joint University of Aberdeen and NES Dean's Prize for her work looking at widening access to medicine. Many of those supported by SMERC have gone on to senior posts in medical education and maintained active interest in educational research.

SKIRC (Safety, Skills and Improvement Research Consortium)

SKIRC brings together the combined innovative capabilities, expertise and experiences of the long-established ‘Safety and Improvement’ and ‘Clinical Skills’ research & development teams within NES. The key purpose of SKIRC is to research, design, innovate, implement and evaluate complex educational interventions that focus on facilitating individual, team, organisational and national learning and upskilling of the NHS Scotland workforce. The goal is to improve overall healthcare system performance (e.g. safety, efficiency, productivity, effectiveness) and the wellbeing (e.g. health & safety, experience, joy, satisfaction) of patients, carers and staff groups.

Building on extensive previous research and development activity, SKIRC continues to contribute to the national and international safety, skills, simulation, improvement and human factors evidence bases via wide-ranging practical outputs and impacts which make a direct contribution to organisational service delivery and the training environment, including:

- Designing and implementing ‘systems approaches’ to learning from events across care sectors at the multidisciplinary team, organisational and national levels
- Implementation of context-specific safety concepts and interventions in specialist and vocational training, CPD and national initiatives involving the primary care workforce

- Embedding Human Factors and Ergonomics principles and methods to support patient safety, care improvement, system performance and workforce wellbeing across NHS Scotland
- Creating R&D leadership capacity and capability through teaching and supervision of PhD and MSc candidates, supporting and advising NES and wider NHS colleagues, and mentoring of NES Clinical Fellows
- Designing and evaluating appropriate innovations in simulation-based education for remote & rural practitioners
- Identifying most efficient use of simulation in anaesthetic training
- Building a national and international reputation as a centre of excellence in researching and evaluating care safety, skills using simulation-based education quality improvement and Human Factors integration to support the educational development of the healthcare workforce.
- Achieving international recognition with ASPIRE Award for Excellence in Simulation which recognises role of innovation and scholarship



**Safety, Skills
& Improvement**

Theme 1:
Developing the Workforce



Theme 1: Developing the Workforce

1. Selection / Widening Access

1.1 Selection into Medical School

SMERC has an 8-year programme of work that is led by Prof Jen Cleland, Aberdeen, in collaboration with a number of UK universities (including Dundee, QMUL, Cambridge, Durham), and externally-funded by, for example, the General Medical Council (GMC) and Medical Schools Council (MSC).



PROFESSOR JEN CLELAND
Director, SMERC

Outputs from this work have informed Scottish, UK and international policy, guidance and practice on how best to select at the point of entry into medical school and widen access to medical school. The focus of this work is two-fold.

First, it has examined and extended the evidence on the best selection tools (e.g. prior attainment, interviews, aptitude tests, assessment of personal attributes and values), how these tools should be combined and weighted, and how changes in selection processes impact on the diversity of medical students.

Continued over...



Outputs from this work have informed Scottish, UK and international policy.

Theme 1: Developing the Workforce

This research programme has diversified to encompass selection into postgraduate medical training and specialty training. Prof Cleland's team was the first to have permission to access the GMC's UK Medical Education Database (UKMED) to examine the relationship between background (e.g., first in family into higher education) and progression in medical education and training.

Second, this programme is leading edge in terms of gathering the evidence on how best to attract applicants from diverse backgrounds to medicine. This is particularly important in the Scottish context as there is increasing evidence, mostly from SMERC projects, that medical students from less traditional backgrounds are more likely to work in under-served areas and in primary care on qualification.

SMERC projects have identified how best to use highly-accessed sources of information (e.g. medical school websites) to attract applicants; how to support teachers in encouraging their able pupils to consider medicine; the evidence base for, and utility of, different types of contextual evidence (e.g. postcode, school) in medical school admissions; and importantly, how medical students from widening access backgrounds perform at medical school and in the Foundation Programme in comparison with their more traditional counterparts. This work promotes best practice and transparency by opening up data held by the sector, informing choice and promoting social mobility. Moreover, Prof Cleland's expertise in this topic is widely recognised in the postgraduate sphere and internationally. She is invited to speak on this topic across the UK, USA, Canada, Africa and Australia on a regular basis. Important outputs from this work include numerous academic papers and reports¹⁻³.

1.2 Selection into Foundation Training

The aim of this area of research was to examine the relationships between a broad range of sociodemographic variables (including pre-entry performance and medical school attended) and performance on the UKFPO selection process measures. This was a SMERC funded PhD project in collaboration with the University of Aberdeen. UKMED data was used to identify what factors, prior to entering medical school and during medical school, affected foundation programme outcomes. This work is ongoing, with several reports and publications⁴⁻⁵.

The most recent outputs from this work stream indicate a direct association between trainees' socio-demographic characteristics and career choices. After controlling for the presence of multiple factors, females, those who entered medical school as mature students and trainees who were "first in family" to degree-level education had statistically significant higher odds of choosing careers in general practice relative to other specialties. The findings can be used by medical school, training boards and workforce planners to inform recruitment and retention strategies. It has obvious implications for the widening access agenda, and equitable distribution of health services. This work is in preparation for publication.

Theme 1: Developing the Workforce

2. Career Decision Making

2.1 Career Preferences

Numerous specialties and localities face issues in recruiting and retaining trainees and consultants. A 10 year programme of work funded by NES initially, then via SMERC and external funding bodies has contributed a significant evidence-base to this important topic.



This work is led by Cleland and Johnston (Aberdeen) who have looked at topics including:

- The value medical students, Foundation Doctors and trainees place on factors relating to their careers
- The central importance of the clinical working and learning environment in recruitment and retention
- How best to support medical students, trainees and staff, and hence help recruit and retain trainees, and ensure NHS Scotland has the right staff, in the right places, to meet healthcare needs.
- Medical shortages – while other work suggests that doctors-in-training are willing to take up unattractive posts if financial incentives are offered, SMERC research indicates that this approach is likely to be, at best, a “short term” solution to filling training posts. Improving working conditions and the culture of the learning and working environment are more likely to have sustainable and long-term impact on recruitment and retention.
- A SMERC funded PhD project in collaboration with the University of Aberdeen utilised innovative methodology to identify preferences and factors affecting career choices using a Discrete Choice Experiment (DCE) for all foundation doctors in Scotland. This work has now been published⁶.
- A SMERC project entitled “Getting on” in medicine used the National Training Survey data about careers preferences to gain understanding of the socio-demographic characteristics and preferences influencing medical careers decision making in a contemporary cohort of FY2 doctors. This work is in preparation for publication.
- SMERC (Cleland, Walker, Johnston) were funded by the UKFPO to explore the differences between doctors who apply for core / general practice training in Foundation Year 2 (FY2), and those who take time out of training before applying for higher training. This work is in preparation for publication.
- Work in submission for publication by Kumwenda and colleagues at the University of Aberdeen has identified that medical students from lower socio-economic groups are more likely to apply for a foundation programme nearer their parental home.

Theme 1: Developing the Workforce

2.2 Foundation Programme Destination Survey Report

Each year the UK Foundation Programme Office (UKFPO) commissions a survey of all F2 trainees which aims to determine their career aspirations and destinations. The Scotland Deanery plays a key role with this report each year. In 2018, the Scotland Deanery was instrumental in designing, delivering and analysing the survey. The Scotland Deanery also produces a written report which was the basis of the ninth publication of this document in 2018. This report uses data collated from all 20 UK foundation schools. The 2018 survey received 6,407 valid responses, which gives an overall response rate of 86.8%.



The UKFPO Destination Survey Report, summarises the data collected from this survey and includes:

- Next career destinations
- The proportion of doctors progressing into psychiatry and general practice (GP) specialty training

- Doctors who undertook Medical Royal College exams during F2
- The numbers of specialty training and service posts being taken outside the UK
- The percentage of doctors leaving the UK and those intending to return within five years
- Doctors who intend to work less than full-time

The percentage of foundation trainees remaining in the UK to work as a doctor either in service or training posts is comparable to that of previous years, with 55.6% of F2 doctors continuing to undertake clinical roles within the NHS upon completion of the foundation programme. There has been little overall change to this percentage over the last five years, indicating that doctors completing foundation training are playing a key role in the delivery of service within the NHS.

Since 2011 there has been a continuing trend showing a decline in the number of F2 doctors moving directly from the foundation programme into specialty training in the UK. Work continues, analysing the free text comments from this survey to understand new doctors long term aspirations for career destinations post Foundation Training. This information is used by key stakeholders including medical schools, health boards and the devolved governments to inform future workforce and training policy frameworks.

Theme 1: Developing the Workforce

2.3 Broad Based Training (BBT)

Broad Based Training (BBT) is a new core training programme for Scotland.

It offers trainees a firm broad foundation in four specialties with direct entry into year two of any of these four specialties.



The programme includes six months in each of the following specialties:

- Internal Medicine Training
- General Practice
- Paediatrics
- Psychiatry

During each of the four attachments, 10% of training time is spent in one of the other three specialties. The programme allows time and confidence to develop before having to progress to a further career choice. The first cohort of eleven BBT trainees began their training in August 2018. A qualitative evaluation is underway, taking a 360 degree perspective – i.e. exploring the views and experiences of trainees, Educational Supervisors, Associate Deans and other key stakeholders.



The programme allows time and confidence to develop before having to progress to a further career choice.



Theme 1: Developing the Workforce

2.4 Thriving in Medicine

In 2016 a working group was set up within the Training Management workstream of NES to consider ways to support trainees during what can be a stressful and challenging job. As a result, a three-part Thriving in Medicine course was developed, to be delivered to Foundation year one (FY1) doctors from their commencement in clinical practice. The aims of the course were: to equip Foundation doctors with knowledge of the emotional challenges of working in modern medicine, and the skills to recognise these challenges, build a personal toolkit and participate in reflective discussion.



In Autumn 2017, a voluntary pilot course was offered in Tayside, comprising three face-to-face modules delivered over a 12-16 week period. In order to increase participation, the course was also opened up to FY2s. Evaluation of the modules comprised several strands including: evaluation sheets completed at the end of each module, resilience questionnaires completed at two time points (near the start of the Foundation year and after the final module in December) and a more in-depth qualitative analysis.



Key questions to be answered by the evaluation: how far the modules addressed trainee needs and whether attending the modules had been beneficial for trainees.

The modules evaluated very well with trainees appreciating the opportunity to share experiences and hear from senior doctors about ways of coping with mistakes and stress. They had enjoyed the mixture of presentations, small group discussions and videos and most felt that they had been able to take something positive away from the module(s) they went to – for example, in terms of greater self-awareness so that they would understand when they are more likely to make mistakes, and resilience in terms of bouncing back from difficult situations and realising that they are not alone in feeling overwhelmed at times. They had learned useful coping tips and had been able to apply some to their everyday practice. In some cases, they had shared what they had learned more widely. The course has been further developed based on the pilot evaluation and is being run again for the August 2018 intake of FY1 doctors. It is being expanded to other health boards – Lanarkshire and Lothian – in addition to Tayside and is being evaluated again.

Theme 1: Developing the Workforce

3. Developing Staff

3.1 GP Fellowships

To examine the potential for one model of a career development pathway for general practice, delivering on new ways of working this study reported the perceptions and experiences of clinicians who had undertaken the first year of a community GP fellowship. The evaluation highlighted issues for both Fellows and stakeholders to address including: educational development of Fellows in both primary and secondary care environments, practical construction and application of community ‘hubs’, and identity and status of GP fellows. The impact of this research will enable planning for future years of the Fellowship to evaluate any potential reductions in hospital admissions and develop the foundations laid in increasing collaboration between primary and secondary care⁷.

3.2 Practice-Based Small Group Learning (PBSGL)

To examine how the perceived purpose of one method of inter-professional learning (PBSGL) can influence the learning environment this study examined how PBSGL groups recruit members and decide on meeting dates and venues. The findings demonstrated recruitment to groups being prioritised along two distinct lines – those whose main purpose was learning and tended to encourage diverse membership and those whose main purpose was peer support and trust in the educational environment which tended to be ‘narrower’ in membership. The impact of this research highlighted the different preferences of health and care staff in relation to their educational environment and need for trust and peer support within groups. This will help inform the development of NHS Scotland interprofessional learning initiatives in order that educational priorities and preferences are offered and accommodated⁸.

Theme 1: Developing the Workforce



The impact of this is to inform on one model of interprofessional learning to help deliver new ways of learning and working together for the primary care team.

3.3 PBSGL – A Survey of Registered Pharmacy Staff and General Practice Nurses

This study examined the factors that motivated General Practice Nurses and registered pharmacy staff to join the inter-professional learning method of PBSGL and what motivated these staff to continue with this model of learning⁹.

The findings highlighted that the dominant reasons to join and stay in the programme related to:

- Learning issues
- Meeting learning needs
- Learning from peers and professional socialisation.

The impact of this is to inform on one model of interprofessional learning to help deliver new ways of learning and working together for the primary care team.



Theme 1: Developing the Workforce

3.4 CPD Preferences and Activities of General Practitioners, Pharmacy Staff and General Practice Nurses in NHS Scotland – A Questionnaire Survey

In the United Kingdom (UK), taking part in continuing professional development (CPD) is a requirement for revalidation with the regulatory bodies for general practitioners (GP's), general practice nurses (GPN's) and for registered pharmacy staff - pharmacists and pharmacy technicians. Revalidation for medical practitioners was introduced in 2012, and for GP nurses in 2016. At the time of the study, the General Pharmaceutical Council (GPhC), the UK regulatory body for pharmacy professionals, was introducing a revalidation framework for registered pharmacy staff.

Little is known about current CPD preferences and activities of these four professional groups in primary care in NHS Scotland. Recent changes in Primary Care workforce, increased interprofessional working, and regulatory changes, as well as advances in technology may have influenced CPD for these professions.

NES CPD connect developed a questionnaire to identify the CPD preferences and current activity for GPs, GPNs, pharmacy technicians and pharmacists.

The key aims were to:

- 1 Quantify the time spent on CPD activities per year
- 2 Establish which learning methods and resources were being used by the professions
- 3 Determine where and when CPD activity took place, and whether other professions were involved in shared CPD activities
- 4 Determine if working in a remote and rural or deprived setting influenced CPD.

This study was conducted by NES CPD Connect and is in the process or writing up for publication in two papers – one qualitative and one quantitative.

Theme 1: Developing the Workforce

3.5 Leadership in General Practice

This study explored how GP trainees learn about leadership in their training practices. It identified three learning processes contributing to leadership development: evaluating leadership, formulating views on leadership and constructing a personal leadership identity. This allowed for the construction of a model for the informal leadership learning process.

The impact of these findings will enhance the facilitation of leadership learning by GP trainers and positively influence the delivery and content of leadership courses¹⁰.

3.6 Quality Improvement in a Homeless Healthcare Setting

This study explored the feasibility, acceptability and potential impact of a patient centred care quality improvement (QI) method – ‘always events’, within a primary care service for homeless patients¹¹. The acceptability and feasibility for its use in delivering QI metrics to enable service providers to optimise care issues identified by this vulnerable group of patients as always being important to them was demonstrated.

The impact of this research is to encourage health and care providers to adopt a person-centred approach to QI in patient groups who have previously been thought of as ‘hard to reach’ and potentially limited in their health literacy.

Theme 1: Developing the Workforce

3.7 Training Needs for GPs in Relation to Delivering Effective Healthcare to Migrants, Including Asylum Seekers and Refugees

This study reported the experiences of GP Speciality trainers and trainees in Scotland in providing healthcare to migrants, including asylum seekers and refugees, and explored their views on the knowledge and training required to deliver effective healthcare to these groups¹². Findings demonstrated a general lack of confidence in managing migrant health issues - in particular, variable experience with interpreting services; limited understanding of the rights of different groups of migrants (e.g. undocumented migrants, asylum seekers, refugees) and of the asylum process itself - but recognition of the significant stress faced by those going through it; and differing views on the concept of 'cultural competence'. The impact of these findings will lead to the development of resources for trainers and trainees beyond experiential learning such as face-to-face training using cases / scenarios, and / or an online resource for reference.



The impact of these findings will be to lead to the development of resources for trainers and trainees beyond experiential learning.



Theme 1: Developing the Workforce

3.8 Primary Care Transformation

The need to educationally support senior general practitioners in leading the development and implementation of GP quality clusters as a 'new way of working' in NHSScotland is now firmly established.

To support this important national work, the SKIRC team undertook a linked series of research and development activity¹³⁻¹⁵:

- 1** To identify available resource resources and delivery mechanisms to upskill and support GP clinical quality leads and practice quality leads
- 2** To understand in-depth the key educational and service challenges facing the current primary care transformation agenda
- 3** To highlight and act on supporting the learning needs of cluster quality leaders across NHSScotland.



Theme 1: Developing the Workforce

3.9 Pharmacy Evaluation of Modular Pre-Registration Programme

In the academic year 2013-14, NES developed and initiated a modular pre-registration programme consisting of three blocks of training within different pharmacy settings. A qualitative evaluation of this programme was conducted in 2017, exploring the views, experiences and expectations of participant trainees, tutors and employers towards the programme. Four key themes were identified: relationships; preparedness; working practices and trainee attributes and motivations.

The modular programme provided a broad experience of pharmacy practice. A practical understanding of the pharmacists' role within primary and secondary care and working with multiple tutors and teams across multiple settings has provided a more integrated and holistic approach to patient care. Tutors and employers felt this produced professionally prepared for practice and highly employable pharmacists. Trainees highlighted that the programme informed their choice of career path, however it was demanding and suited well-motivated individuals.

A further longitudinal quantitative evaluation is now being undertaken in collaboration with Ruth Edwards, Aston University (previously RGU) between April 2018 and December 2022.

3.10 Evaluation of the Pharmacy Technician Vocational Training Foundation Programme (PTVTFP)

NES Pharmacy are undertaking an Evaluation of the Pharmacy Technician Vocational Training Foundation Programme (PTVTFP) in conjunction with Christine Bond at Aberdeen University with SMERC monies.

At present we are only evaluating the framework for General Practice pharmacy technicians (n=26). Focus groups were held with these pharmacy technicians undertaking the pilot along with separate groups for their tutors. These were all undertaken at their induction sessions held in May in Edinburgh / Glasgow. We have also emailed out a baseline questionnaire to these pharmacy technicians and have also encouraged them to submit audio diaries. Once the framework is available for hospital and community we plan to organise more focus groups at their Induction sessions in February 2019 and send out baseline questionnaires.

Theme 1: Developing the Workforce

3.11 National Evaluation of Pharmacy First Service in Scotland

Pharmacy First is a clinical service in which patients are encouraged to seek advice and treatment from community pharmacists before making an appointment in General Practice. In Scotland the model of Pharmacy First uses Patient Group Directions (PGDs) as the legal framework for supplying appropriate prescription medicines. Following a successful pilot in NHS Forth Valley, a national Pharmacy First service was implemented across Scotland from December 2017 for the treatment of: i) uncomplicated Urinary Tract Infections (UTI) in women (16-65 years) and ii) impetigo in children. NHS Education for Scotland (Pharmacy) was tasked with evaluating the implementation and impact of the service.

The evaluation was funded by the Scottish Government via NES as part of the Pharmacy First Initiative. NES appointed Catriona Matheson, Freelance Health Researcher who evaluated the Forth Valley Pilot, to undertake the evaluation.

The objectives of the Pharmacy First evaluation were to:

- 1 Determine patient satisfaction

- 2 Describe the patterns of use (days, time, condition) of the service

- 3 Determine whether Pharmacy First should be expanded, from the perspectives of pharmacy, patients and General Practice, and if so, for which conditions

- 4 Identify any issues or barriers to effective implementation

- 5 Identify whether Pharmacy First has had any measurable impact on Out of Hours care and NHS 24 contacts.

The evaluation used quantitative, cross-sectional data collection for patients and professional stakeholders. This was complemented by national statistics on Out of Hours and NHS 24 calls.

Data was collected between April and September 2018 and a report has been drafted and will be submitted to the Scottish Government by the end of October 2018.

Theme 1: Developing the Workforce

3.12 Evaluation of Pharmacy Vocational Training Foundation Programme

An exploration of the cross-sector Pharmacist Vocational Training Foundation Programme: is the training programme fit for purpose? Phase 2.

This study is being undertaken in collaboration with Professor Christine Bond, The University of Aberdeen. It started in Sept 2017 and will be complete in 2020.

The aim of the study is to conduct a mixed methods approach to evaluate the cross- sector Pharmacist Vocational Training Foundation Programme. The overall aim is to explore whether the programme develops the appropriate behaviours and skills to enable pharmacists to work within the different sectors of practice.

The evaluation will inform of changes that are required to be made to improve the programme. The Lead researcher will write a report for the stakeholder group detailing strengths and weaknesses of the programme and actions required to improve the programme for dissemination throughout NHS Scotland as appropriate. There will also be presentations to the VT Foundation Working Group, The Directors of Pharmacy Group, Community Pharmacy Scotland, The Primary Care Leads Group and Health Education England (HEE).

Theme 1: Developing the Workforce

3.12 Evaluation of the NES General Practice Clinical Pharmacist Competency & Capability Framework

The General Practice Competency & Capability Framework was launched in September 2016 to support practice and development Pharmacists working in these roles in all Health Boards across Scotland and employed with new Primary Care Funding (2015-18). The first credentialing of pharmacists completing the Framework will occur in March 2019 and will consist of portfolio review and a viva. External reviewers have been commissioned for this purpose.

Prior to the launch of the Framework for all Pharmacists working in General Practices across Scotland, researchers at the School of Pharmacy, University of Strathclyde are being commissioned to undertake a piece of work to ascertain if the GPCP Competency and Capability Framework is fit for purpose for this group of practitioners to include delivery and development of new Pharmacotherapy services, as a part of the new General Medical Service contract going forward.

This work is expected to be completed in summer 2019.

3.13 Pharmacists and Pharmacy Technicians Working in General Practice Educational Evaluation

NES Pharmacy has produced a national Learning Pathway for Pharmacists employed to work in General Practice across Scotland with Primary Care Funding (2015-18) which was launched in September 2016. The pathway consists of direct learning events – 3 days (DLEs), e-learning, completion of a Competency and Capability Framework and national webinars.

An external independent researcher was commissioned in 2016 to evaluate the learning from the first 3 cohorts of Pharmacists (n=135), the aim of which was to assess the educational support provided for these Pharmacists to inform an educational support framework for this new career path in the future. The Pharmacists were followed up one year after attending the initial DLE.

This work will complete by December 2018.

Theme 2:
Developing the Clinical
Learning Environment



Theme 2: Developing the Clinical Learning Environment

4. The Learning Environment

4.1 Factors that Affect the Clinical Learning Environment

Two recent SMERC projects focused on this theme¹⁶⁻¹⁷. The first drew on management theory, and focuses on exploring the experience of working in various clinical environments, some which are rated positively, others less so, in external reviews such as the NTS, to identify the group and systems factors which influence the quality of the CLE. The second looked at the key interventions that are used to address the learning / care balance at the interpersonal and organisational levels. SMERC is now working in collaboration with the GMC on a project called “Departments in need of support”, to examine if routine data (e.g., NTS data) can be used to predict and prevent problems in training programmes.



The second looked at the key interventions that are used to address the learning / care balance at the interpersonal and organisational levels



Theme 2: Developing the Clinical Learning Environment

4.2 Scottish Trainee Survey (STS)

The Scottish Training Survey (STS) was introduced in 2013 and all trainees complete it at the end of each post they undertake. The driving aim is to have a survey that produces robust indicators for quality management. The survey collects both quantitative and qualitative data. Quantitative data allows for the production of RAG (Red and Green) reports. The RAG reports are a means of summarising the responses to the survey that gives a single reference statistic which provides an indication of the units that are most likely to be examples of best practice or have issues that require intervention, such as a visit.



The qualitative survey data – in the form of free text comments – are reviewed by Associate Postgraduate Deans (Quality) in order to see where specific comments can be acted upon to improve particular trainee placements. The free text comments are also analysed more broadly by a dedicated NES researcher, both by training grade and specialty, to see what they can tell NES about overall good and bad trainee experiences. A detailed report of the free text comments is circulated to quality management teams and specialty leads for their consideration, so that each specialty can see if there are any important messages for their training programmes.



The driving aim is to have a survey that produces robust indicators for quality management.

Theme 2: Developing the Clinical Learning Environment

4.3 Developing the Learning Environment Using Simulation

SKIRC is through the Clinical Skills Managed Education Network (CSMEN) involved in ensuring reliable high quality skills delivery in all aspects of patient-centred care from Remote & Rural practice to the operating theatre. In 2018 CSMEN was recognised by the award of the International ASPIRE award. One of the four underpinning criteria for this award for excellence in simulation recognises the important role of scholarship and innovation.



In 2018 CSMEN was recognised by the award of the International ASPIRE award.



Theme 2: Developing the Clinical Learning Environment

4.3.1 Use of Simulation in Building Capacity for Ultrasound Guided Regional Anaesthesia

An award of a grant from Royal College of Anaesthetists and British Journal of Anaesthesia of £69,970 in late 2017 was made to the University of Dundee in collaboration with NES and NHS Tayside to undertake research in exploring whether cadaver simulation training offers the best clinical performance behaviour during ultrasound guided regional anaesthesia.

Ultrasound guided regional anaesthesia (UGRA) is a procedure that obviates the need for general anaesthesia during limb surgery, and improves the surgical outcomes of frail, ill, obese and diabetic patients. However, it is difficult to learn and takes many years to attain expertise. Anaesthetic trainees currently learn ultrasound and needle procedural skills on patients, an approach at odds with the recommendations of the UK Department of Health. Published reports however indicate they lack confidence, find interpretation of ultrasound challenging, display a wide variability in performance, and may expose patients to repeated attempts, pain and harm.



Theme 2: Developing the Clinical Learning Environment



Mastery learning is an educational technique that ensures all doctors gain skills and provides better clinical outcomes

Mastery learning is an educational technique that ensures all doctors gain skills and provides better clinical outcomes. In this research study, the hypothesis is that additional simulation-based training using mastery learning and expert feedback translates to improved clinical regional anaesthesia performance compared to standard training alone (lectures, volunteer scanning and needle alignment practice on a phantom). In this study we are validating the step and error metrics we have developed using 16 UK experts which we have completed in 2018. We will then conduct two trials investigating the translation of simulator performance to patients.

The first trial will determine whether the combination of cadaver training and standard training translates to better clinical interscalene block performance. The second will determine whether mastery learning on the soft embalmed cadaver translates to better clinical interscalene block performance. Our primary outcome will be step and error performance metrics. Secondary outcomes will be eye tracking metrics (measure of cognitive intention and visual perception), quality of anaesthesia, trainee self-efficacy, patient experience and health economics. To supplement the quality of this work we have also been awarded £5000 in 2018 to purchase new eye tracking technology software.



Theme 2: Developing the Clinical Learning Environment

4.3.2 Supporting Remote and Rural Practitioners

(i) Evaluation of The Mobile Skills Unit using a Realist Approach

Realist research is a theory driven approach which is increasingly being advocated in health and social care research (Greenhalgh et al., 2015); and there are increasing numbers of publications from researchers based in or affiliated with Scottish healthcare and educational institutions who are utilising Realist methods to address ‘messy’ and complex issues in practice through research which addresses the NES / priority areas of quality of the workforce, enhanced educational infrastructure, new models of care and an improving organisation:

Susan Somerville has been using a realist approach to explore what influences the impact of the Mobile skills unit (MSU) in terms of what has worked, for whom, how and why¹⁹⁻²⁰. The heterogeneity of contexts and causal mechanisms for success are many and impact upon its capacity and sustainability. Analysis of the literature combined with fieldtrip reports and observations, and semi-structured interviews are being used to gather data from a range of perspectives & stakeholders to explore this complex intervention. The interpretation of data in terms of organisational, interpersonal and /or individual factors is critical to the enhancement of mobile simulation and will provide new knowledge and insights which will inform future educational practice.

A **Realist** lens is illuminating the **mechanisms** influencing **outcomes** by exploring heterogeneous **contexts**



“Nothing works unconditionally in all circumstances.”

Tilley, 2009



Theme 2: Developing the Clinical Learning Environment

(ii) Remote and Rural Practitioners Portfolio Project

A grant of approximately £65,000 was awarded to BASICS with input from CSMEN to enhance remote and rural practitioners pre-hospital emergency skills. A four year cycle uses a blended approach to learning for health care practitioners in Remote & Rural Scotland. Participants undertake training using simulation in modules of learning in trauma, paediatrics, the deteriorating patient and common emergencies as core with the opportunity for ENT, eye and psychiatric emergencies to be added in as required. This has been undertaken and evaluated in year 1 in Campbelltown, Skye and Mull²¹.

(iii) Use of technology

Building on the development of a blended approach to learning using evidence-based e-learning resources in technical and nontechnical skills aligned to workshops on the mobile skills unit, CSMEN have been exploring now technologies through workshops and presentations in collaboration with Heriot -Watt and SCSN²²⁻²³.

(iv) Development of the team

One of the key strategic requirements of the original Scottish Clinical Skills Strategy was to ensure simulation-based education could be accessed by any healthcare professional wherever in Scotland. A survey of the AHP practice leads identified that there was no clear understanding of what constituted a clinical skill amongst AHPs²⁴⁻²⁵. Two approaches have been initiated - an online module to introduce the concept and the multi-professional e-learning resources available and a series of showcasing as a way of identifying scenarios for simulation-based education and training. This will ensure all members of the healthcare team. These interventions are currently being evaluated.

Theme 1: Developing the Workforce

(v) Remote and rural practitioners' CPD

20% of Scotland's population lives in rural areas and there are significant challenges to the delivery of health and social care including transport and infrastructure limitations, fewer hospital services, and slower broadband speeds. There is a need to improve recruitment and retention of healthcare staff, including general practitioners (GPs), general practice nurses (GPNs), and pharmacy staff.

Easy access to CPD can positively influence recruitment. Professional isolation can have detrimental effects because of job dissatisfaction and R&R professionals are less likely to remain if there is limited access to CPD. The Scottish Government committed to increase the NHS budget for R&R communities and supported the provision of superfast broadband. Their aims were to overcome barriers to service development and support technology-enhanced CPD.

NES CPD Connect will investigate, through the use focus groups and interviews, how and why R&R practitioners gained CPD and how they would want this to change in the future.

The following questions will be answered:

- 1 How do R&R practitioners and teams achieve CPD?

- 2 What resources are available and why are they chosen?

- 3 How (and why) would practitioners prefer to learn in the future?

- 4 What impact has PBSGL had on learning and sustainability in R&R areas?

- 5 What are practitioners' perceptions and experiences of inter-professional learning?

This study is in the data collection phase.

Theme 2: Developing the Clinical Learning Environment

4.3.3 The Development of a Capability Framework for Simulation Technicians²⁶⁻²⁷

CSMEN has been leading the development of a framework for Simulation technicians over the past 12 months. There is international consensus that Sim technicians need to be recognised for their specialist capabilities in delivering quality simulation-based education.

Establishing a national educational framework of Sim tech capabilities will enable:

- Recognition of Sim techs currently working in this specialist area with agreed capabilities at an expected standard
- Domains of practice to be identified and agreed
- Agreement around evidence required for each capability within each domain

This initiative has been led the Scottish Centre for Simulation and Clinical Human Factors as part of CSMEN. To establish a national framework for simulation technician capabilities a two-pronged approach was used based on a modified Delphi approach to gain consensus. A review of the literature and current initiatives led to a series of expert group meetings of simulation technicians to develop the first draft of a national capabilities framework. This was circulated electronically to all simulation technicians to agree each of the capabilities, add additional ones and then in a further iteration to prioritise them into core, advanced and optional capabilities.

The initial survey resulted in 21 capabilities. The second survey prioritised these into core, advanced and optional capabilities for simulation technicians.

The agreed framework, will enable simulation technicians to meet local expectations and national requirements whilst presenting appropriate and relevant evidence. This enables them to continuously improve and ensure the simulation training provided reaches a similar quality wherever the training is being provided.

Theme 2: Developing the Clinical Learning Environment

4.3.4 Identifying National Clinical Skills Training Needs of the Healthcare Workforce

The last training needs analysis in relation to Clinical Skills training using simulation in Scotland was undertaken in 2008 and involved those practising in Remote & Rural Scotland.

In 2018, over 40 members of the Clinical Skills Managed Educational Network (CSMEN) came together at a launch meeting of the new MSU and as a first step to developing a new training needs analysis participated in a roundtable exercise.

Stage 1 to inform Training needs analysis Roundtable Consultation exercise.

The CSMEN group had developed a series of questions to trigger these preliminary discussions:

- Why does the MSU work better in some venues than others?
- How can we share best practice in simulation-based education?
- How can we maximize the use of the MSU across all venues?
- What targets would engage health boards in prioritizing team training on the MSU?
- How can we engage all health care practitioners with using the MSU?
- What are the main priorities for Simulation based education going forward?
- How can the simulation educator community in Scotland work more collaboratively?
- What are the challenges for some professional groups accessing the MSU and how might these be overcome?
- How can we maximise the impact of the MSU visits?
- What added value can the MSU provide for health care practitioners?

Theme 2: Developing the Clinical Learning Environment

4.3.5 Development of a Quality Assurance System for Simulation-Based Education

The CSMEN has led the development of a quality assurance framework for simulation based education to ensure that whoever you are in Scotland wherever you are and whatever your professional background you receive the same standards of educational approach.

The common quality standards, educational resources and training programmes developed and delivered through the Scottish system for SBE are subject to an independent, robust and open review process. This gives the public and health service managers confidence in the quality of clinical skills education and delivery and enable the skills training to be explicitly linked with UK and Scottish competency frameworks.

This has led to the development of The Simulation-Based Educational Quality Assurance Process



This is based on the brief immersion and debrief model

Theme 2: Developing the Clinical Learning Environment

1. Brief

This includes a national outcomes framework for faculty development underpinned by a continuous quality improvement approach which has been matched vs AoME, ASPiH and GMC frameworks. A technical capability framework for simulation technicians, a database of facilities and resources and a national approach to evidence based on line resources.

2. Immersion

The Quality Assurance system components as part of the immersion includes self-assessment form which highlights requirements for a programme, provision of nationally accredited programmes an agreed scenario template and standard manikins and video debriefing capability as part of required facilities.

3. DeBrief

There are national 'How to' guides accessible on the CSMEN website which include guidelines on debriefing and feedback. This is supported by a national faculty development programme for the mobile skills unit which includes training and updates for all those facilitators working on the unit. This is now linked to a national faculty database of simulation based educators.

Theme 2: Developing the Clinical Learning Environment

5. Building a Safety and Learning Culture

5.1 Human Factors / Ergonomics Education and Integration²⁸⁻³³

A key part of the SKIRC role is co-leading national development work on embedding Human Factors principles in healthcare education and practice. Based on related research, a number of educational and research outputs are helping to building Human Factors capacity and capability nationally in pharmacy undergraduate education, required competencies for healthcare professionals and others (Figure 2), and particularly in implementing concepts and methods in patient safety and quality improvement training, interventions and everyday practices.



Figure 2. A proposed structure for supporting the embedding of Human Factors and Ergonomics principles in health and social care education and practice

Theme 2: Developing the Clinical Learning Environment

5.2 Safety Culture

At the healthcare organisational level, SKIRC continues to be a leading research body in the field of Safety Culture. In collaboration with national and international partners, SKIRC continues to be a key international leader in studying the utility of safety culture tools and their impacts on team and organisational learning³⁴⁻⁴⁰. Recent outputs include: a systematic literature review of the adequacy of the psychometric properties of hospital safety climate tools; testing of a typological approach to team based learning from the prevailing safety culture (Figure 2); in-depth understanding of key safety culture constructs amongst GP teams; development of a systems based model for guiding development of safety culture tools for healthcare organisations (Figure 3); the perceived usefulness of the ‘never event’ safety concept in primary care; a UK patient survey of harmful events experienced in general practice care; and the findings from a national survey of safety climate in general practices as part of the Scottish Patient Safety Programme.



Figure 2. Examples of NES Safety Culture Discussion Cards for health and social care teams

Theme 2: Developing the Clinical Learning Environment

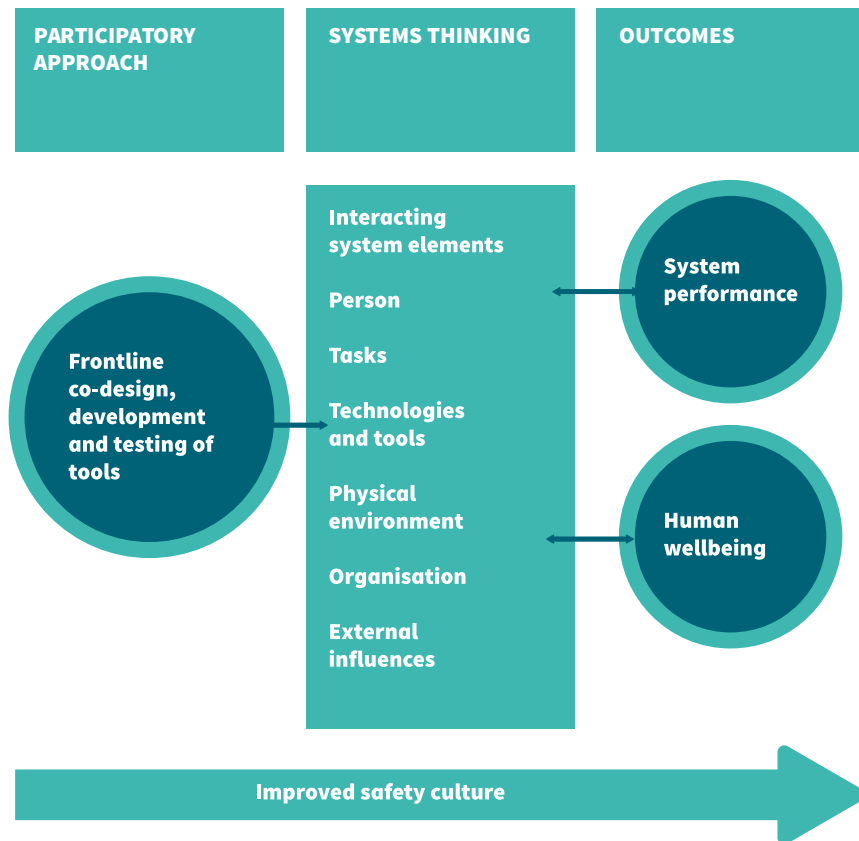


Figure 1. A preliminary Human Factors conceptual model informing a systems approach to improving safety culture theory and practice

5.3 Informing Medical Appraisal and Revalidation

Medical appraisal and associated revalidation are mandatory for doctors in the United Kingdom. However, the quality of appraisal documentation, which informs the revalidation process on a doctor’s fitness-to-practise, is known to be variable. This mixed-methods study by SKIRC⁴¹ led to the development of a 24-item formative educational tool that could be used, as part of routine appraiser training in the general practice setting, to review and provide evidence and feedback on the quality of documentation completion.

Theme 2: Developing the Clinical Learning Environment

5.4 Building Leadership Capacity and Capability for Quality Improvement (QI)

SKIRC continues to lead and contribute to the improvement science evidence base⁴²⁻⁴⁸ through design of a specific programme of research with a clear focus on understanding, informing and supporting NHS Scotland leaders in how best to build Quality Improvement capacity and capability at scale amongst the healthcare workforce.



Examples of related scholarly outputs include:

- A theory-based evaluation of the Scottish Quality and Safety (SQSF) Fellowship in partnership with the Scottish Improvement Science Collaborating Centre
- Generating evidence-based guidance and a related conceptual model (Figure 1) for embedding the reporting of small-scale quality improvement projects in healthcare curricula and programmes
- Testing the implementation of the ‘always events’ approach as a person-centred method for improvement the quality of patient care and enhancing staff wellbeing and leading the international development of a small evidence base for this tool
- Highlighting how process mapping can support the integration of high risk medicine clinical care bundles in community pharmacies
- Demonstrating the transferability of a team sports model to improve brief and debrief activity in neonatal resuscitation
- Learning from clinical negligence claims to better inform design of improvement interventions to support general practice safety management systems for ordering and reconciling test results and reporting outcomes to patients.

Theme 2: Developing the Clinical Learning Environment

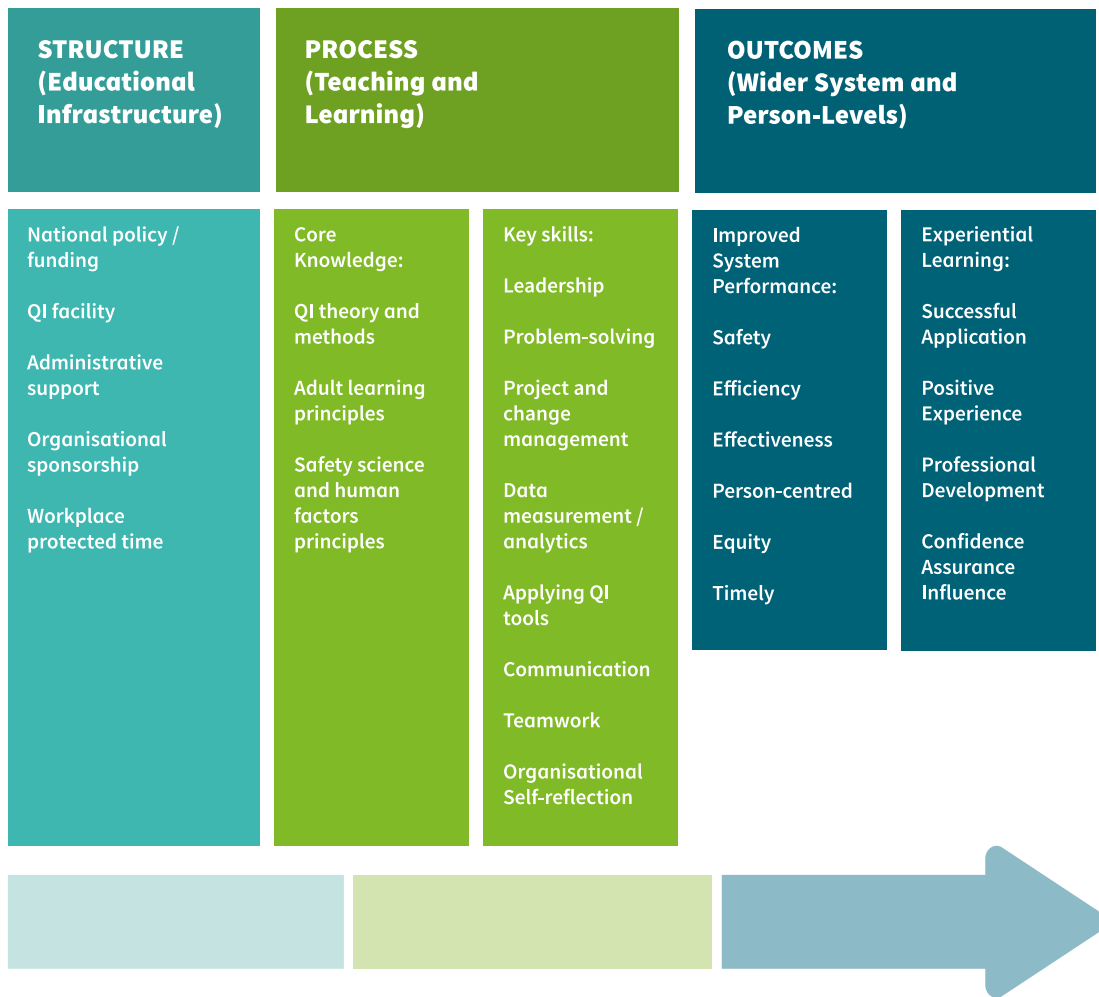


Figure 1. Theoretical Model Underpinning Structure, Process and Outcomes Associated with Application of a ‘Successful’ QI Project by Clinical Trainees and Practitioners

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20. **Somerville S., Baker A., McAleer S., Howden S., Schofield S., Ker J.** Simulation on the move explored through a Realist lens. ASPiH conference 2018
21. **Laird C., Marshall H., Ker J., Richardson N., Jackson C.** Innovative approaches to supporting learning for remote and rural practitioners. Remote and Rural Conference, 2018
22. **Ker J.** Challenges to supporting remote and rural practitioners. Heriot Watt Medical Education Lab Conference [Edinburgh, June 2018]
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1. Outputs – Technical Reports

Shelly Jeffcott, Dawn Mahal, Laura Allison, John McKay and Paul Bowie. Leadership and quality improvement in primary care: a scoping review of educational resources and delivery mechanisms [SKIRC Technical Report, NHS Education for Scotland, Edinburgh: 2018]

Shelly Jeffcott, Dawn Mahal, Laura Allison, John McKay and Paul Bowie. Educational and service challenges in transforming the Scottish primary care system: a stakeholder engagement interview study. [SKIRC Technical Report, NHS Education for Scotland, Edinburgh: 2018]

Jeffcott S., Mahal D., Allison L, McKay J., and Bowie P., The learning needs of Cluster Quality Leaders in Scottish general practices: a mixed-methods study. [SKIRC Technical Report, NHS Education for Scotland, Edinburgh: 2018]

2. Impact – International Recognition

The CSMEN team (Michael Money Penny, Andrea Baker, Jean Ker and Colville Laird) with Caroline Lamb, CEO of NES with the ASPIRE award for Simulation awarded to CSMEN in 2018 - the first organisation in the UK and the first network in the world to receive such an award in simulation.

3. Impact – Outputs

McLeod G., Making cadaver training accessible to all using Virtual Reality, Heriot Watt Medical Education Lab conference, June 2018

4. Impact – Award

Somerville S. Award of £1300 SMERC travelling fellowship to develop a community of practice of realist evaluation research experts

5. Impact – Conference Presentations

Somerville S, Howden S., Schofield S., Ker J Ottawa-ICME Conference; The use and impact of a mobile clinical skills and simulation facility in remote and rural Scotland – a realist synthesis and evaluation, oral presentation, March 2018, Abu Dhabi.

Somerville S., Baker A., McAleer S., Howden S., Schofield S., Ker J., Simulation on the move, explored through a Realist lens ASPIH conference 2018

6. Impact – Conference Symposium

Laird C., Marshall H., Ker J., Richardson N., Jackson C., Innovative approaches to supporting learning for remote and rural practitioners. Remote and Rural Conference, 2018

7. Impact – Conference Presentations

Ker J., Challenges to supporting remote and rural practitioners Heriot -Watt Medical Education Lab Conference

Ker J., Baker A., preventing skills decay using a creative solutions Workshop SCSN Conference

8. Impact – Showcasing and conference presentations

Richardson N., Ker J., Smith W Showcasing the MSU for AHPs. RFVH, 2018

Richardson N., Ker J., Smith W., Engaging AHPs in clinical skills Workshop SCSN Conference

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9. Impact

An agreed national capability framework for simulation technicians

10. Impact – Conference Output

Ker J, Baker A, Moneypenny M, Laird C. Quality assurance why it matters in simulation-based education SMEC conference 2018

Ker J, Baker A, Hardie L, Moneypenny M. How can we support faculty on the MSU ? short presentation SCSN Conference

11. Impact – Technical Reports

ERGEG NES report - The ERGEG noted a number of areas of good practice and innovation during the reporting period including the following:

- A sustained model of implementation of a mobile skills unit to support learning close to the workplace
- Nine evidence based online resources on Turas Learn
- The introduction of a quarterly Simulation Bulletin
- Development of a national faculty development database for the MSU
- Dissemination of the work of CSMEN: A number of workshops were delivered at both national and international conferences (Developing a sustainable faculty for simulation base education, Dubai; An innovative approach to solving skill decay, Wellington, New Zealand).
- The 3rd CSMEN Research and Development Conference in March 2017 with Safety and Improvement. This included a presentation from a funded PhD student who had undertaken a realist evaluation of the MSU

- Development of a national Simulation Based Educator Outcome Framework to share and identify level of expertise
- Development of a National Sim Tech Framework
- Inclusion of other HCP training on the MSU, for example AHPs and a Pharmacist course to practice core clinical assessment
- Development of new programmes on non-technical skills

12. Outputs – Conference submissions

Helen Vosper, Paul Bowie, Al Ross. Should we be teaching pharmacy students patient safety? [Pharmacy Fitness into Practice Abstract Conference Submission, 2018]

Helen Vosper, Paul Bowie, Sue Hignett. The NHS health check for developing Human Factors & Ergonomics competencies. Chartered Institute of Ergonomics and Human Factors: 2018.

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13. Outputs – Peer-reviewed publications

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14. Outputs – Technical Reports

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15. Outputs – Peer reviewed publications

Gheed Alsalem, Paul Bowie, Jill Morrison. Assessing safety climate in acute hospital settings: a systematic review of the adequacy of the psychometric properties of survey measurement tools. BMC Health Services Research 2018 (1), 353

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16. Outputs – Technical Reports

Paul Bowie, Laura Pickup, Dawn Benson, Colin Steven Shorrock, Duncan McNab. Adaptation and user testing of Eurocontrol’s Safety Culture Discussion Cards amongst diverse NHS and social care teams. [SKIRC Technical Report, December 2018]

Gheed Alsalem, Paul Bowie, Jill Morrison. Psychometric Evaluation of the Hospital Survey on Patient Safety Culture in Kuwaiti Healthcare [SKIRC Technical Report, September 2018]

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Paul Bowie, Diane Baylis, Julie Price, Al Ross. Is the “Never Event” concept a useful risk management strategy in complex primary care systems? [SKIRC Technical Report, July 2018]

17. Outputs – Peer reviewed publications

Murie J, MacWalter G, Bowie P. Preliminary co-design and testing of a feedback tool to improve the quality of peer appraiser documentation for medical revalidation. Education for Primary Care [In Press]

18. Outputs – Peer-reviewed publications

Grosset KA, Deary E, El-Faragy N. Patient-centred improvement to repeat prescribing using the Always Event concept. BMJ Open Quality 2017, 6 (2) e000042

Kay C, Lowe D, Bowie P. Testing of the “Always Events” approach to improve the patient experience in the Emergency Department. BMJ Open Quality [In Press]

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19. Outputs – Technical Reports

Madalina Toma, Avril Blamey, Laura Allison, Shobhan Thakore, Nicola Gray, Paul Bowie. Evaluation of the Scottish Quality and Safety (SQSF) Fellowship. [SKIRC Technical Report, NHS Education for Scotland, Edinburgh: November 2018]

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Rebecca Jordache, Cora Doherty, Celyn Kenny, Paul Bowie. Preliminary adaptation, development and testing of a team sports model to improve briefing and debriefing in neonatal resuscitation. *Pediatric Quality* [In Press]

Diane Baylis, Julie Price, Paul Bowie. Content analysis of 50 clinical negligence claims involving test results management systems in primary care. *BMJ Open Quality* [In Press]

This resource may be made available, in full or summary form, in alternative formats and community languages. Please contact us on **0131 656 3200** or email **altformats@nes.scot.nhs.uk** to discuss how we can best meet your requirements.



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