

Institution: University of Salford

Unit of assessment: UoA03 Allied Health Professions, Dentistry, Nursing and Pharmacy

a. Overview

We are one of Europe's largest providers of health and social care education and training. Over the last 5 years we have focussed our strategy on reinforcing our widely acknowledged peaks of research excellence and this has delivered tangible dividends. We have attracted over £7M in external grants and achieved a conversion rate of 40% over the REF period. We have built multiple significant partnerships with major national and international healthcare providers and industry. We also have a strong record of involving users and practitioners in the planning, conduct and dissemination of research. Our internal strategy has focussed on developing strong support for research by staff and students as demonstrated by the number of staff involved in internationally excellent research and our PGR completion rate. As a result of our strategies we have established a consistent record of influential publications that impact on practice, policy and the economy.

The *College of Health and Social Care* is one of four Colleges which comprise the University of Salford. It includes nursing, midwifery, social work, physiotherapy, occupational therapy, podiatry, prosthetics and orthotics, radiography and sports rehabilitation. Podiatry is the largest unit of its kind in Europe and we are England's only centre for training prosthetists and orthotists. We take pride in preparing health and social care professionals for the increasingly challenging and complex environment in which they now practice. Research within the College covers basic biomedical and psychosocial research, intervention studies, professional practice and health and social care policy. Clinical collaboration and public and patient involvement is threaded through all our work building on our strong and evidenced commitment to engagement that was commended in RAE 2008.

The College comprises two Schools. The *School of Health Sciences (SHS)* covers the range of allied health professions listed above. The *School of Nursing Midwifery and Social Work (SNMSW)* specialises in children's and young people's nursing, adult nursing, mental health nursing, midwifery, counselling and psychotherapy, social policy, sociology, criminology and social work. Most of research within the College falls within UoA 3 or UoA 22 *Social Work and Social Policy*. The *School of Computing, Science and Engineering* has strongly supported the health and rehabilitation technology research included in this submission.

b. Research strategy

Our successful submissions to three Units of Assessment to RAE 2008 resulted in a substantial increase in QR income providing new impetus for continued strategic management of research growth that had commenced in 2001. Until July 2009 all College research was managed through the *Institute of Health and Social Care Research*. In 2009 the University agreed six strategic key goals around teaching, research, enterprise, internationalisation, infrastructure and its people. Research was core to the mission of the University and research undertaken was to be purposeful, applied and impact distinctively on the knowledge economy, and to underpin teaching and community engagement. To facilitate this vision, the research institutes were successfully reconfigured to embed research groups, strategy and management within the Schools and integrate research with all other aspects of University strategy, business, management and resources. This has been a resounding success.

These structural changes were based on a number of priorities established by the College and Schools to deliver University level goals. These priorities were: achieving a year-on-year improvement in research quality and quantity; building upon existing, and establishing new, peaks of excellence; embedding research leadership in all aspects of College/School management; encouraging a culture of research and innovation; and increasing investment in people and facilities. Choice of research areas is driven by key national and international policies highlighting long term conditions and complex interventions, user involvement and engagement, health care technology, health promotion and preventive medicine, and service evaluation and innovation. Strategic and operational policies to deliver this agenda have been implemented since 2009 with strong support from Heads of School and successive Deans committed to research growth. Tangible growth has resulted in all measures of research: quality, volume, income, partnerships and external reputation and close alignment with national and international priorities. This narrative reports this achievement.

Research management and planning.

Research is a College responsibility led by **Prof Warne**, Associate Dean for Research and Innovation. He chairs the College Research and Innovation Committee (CRAIC) and reports directly to the Dean and PVC Research. **Profs Hogg** (SHS) and **Hardiker** (SNMSW) are Associate Heads of School for Research & Innovation with strategic and operational responsibilities in their respective Schools reporting to the Head of School and Associate Dean for Research. They direct the virtual *Centre for Health Sciences Research* and *Centre for Nursing, Midwifery & Social Work Research* embedded within their respective Schools.

Each of the Centres is subdivided into a number of research groups embedded within the School structures to ensure research is integrated with wider business. These research groups were determined based on a strategic decision to build on existing areas of strength, professorial leadership, and the leadership qualities of specific staff at SL/Reader level with clear professorial potential, and to do research that impacts upon practice. These foci have been reinforced by five external appointments at Chair level.

The research groups relevant to this Unity of Assessment within SHS are *Diagnostic Imaging* (**English, Hogg, Szczepura**), *Foot and Ankle Biomechanics* (Footprint: **Prof Nester, Williams, Liu, Hashmi**), *Gait Analysis and Biomechanics* (Gaitway: **Prof Baker, Findlow**), *Functional Electrical Stimulation and Rehabilitation Technologies* (FES&RT: **Kenney, Prof Howard, Hutchins, Preece, Thies, Graham-Smith**), *Health and Wellbeing in the Workplace* (HWW: **Profs Dugdill, Cook and Granat, Cooper**), *Knee and Injury* (**Jones, Herrington, Pearson**), *Rehabilitation Research* (**Prof Hammond, Hollands**).

The relevant research groups within SNMSW are *Advancing Midwifery Practice* (**Hollins-Martin**), *Research with Children, Young People and Families* (**Prof Long, Livesley, Devitt**), *End of Life Care* (**Prof Johnson**), *Health Technologies and Evidence* (**Prof Hardiker, Brettle, Grant, Staniland, Ball**), *Public Engagement in Research and Education* (**Williamson**), *Supporting People with Long-term Conditions* (**Prof Ormandy**), *Acute Care* (**Prof Astin, Mitchell, Mottram**), *Mental Wellbeing* (**Prof Warne, McAndrew**)

These groups deliver managed portfolios of research that follow specific lines of enquiry, lead nationally/internationally in the area concerned, and are relevant to the School, College and University strategic vision. They are also the conduits for all investment and management of research activities. Thus, funded PhD studentships, use of internal funds (e.g. Vice Chancellor Early Career Researcher Scheme, Research Summer Studentships, use of staff discretionary accounts), allocation of staff time for research, support for staff doing PhDs, supervision of self- or externally-funded PhD students, are only permitted where there is clear alignment with the groups' agreed research priorities. Appointment of senior academics (SL/Reader/Chair) and development of 'rising stars' are based on alignment with current and future research

priorities, as defined by the groups. New groups (e.g Acute Care, Diagnostic Imaging) have been fostered only when new opportunities for research growth have been identified.

Each group has an appointed lead, typically a Professor, who sets the focus of research activities, prioritises projects, bidding, publication strategies and provides an external face. He or she manages PGR students and mentors and supports academic staff through a formal role in the annual Performance Development Review (PDR) process. Their direct or indirect input at CRAIC ensures clear alignment of research activity with College and University aspirations. Their performance is managed directly by Heads of School against School KPIs.

Future Strategic Aims and Goals for Research

The current University research strategy has recently (2013) been reviewed to establish clear priorities aligning with the broader University trajectory. This strategy builds on the core values that are now well-established in the College: (1) build on peaks of excellence (2) grow research leadership (3) work in partnership with NHS, industry and other stakeholders (4) do research relevant to practice and real-world challenges. Through continued strategic planning we will deliver University aspirations: for research to lead teaching and curriculum innovation; to build long-lasting domestic and international partnerships; and to provide a quality and sustainable scholarly environment for staff and students development. Specific aims include:

- 1) Continue to invest in areas of strength: to ensure sustainability but also use the strong research base as a means of accelerating the development of other staff, for the wider benefit of the health and social care disciplines, and the wider University ambitions.
- 2) Convert appropriate collaborative relationships into partnerships, thus building long-lasting strategic relationships both nationally and internationally.
- 3) Embed practitioners, users and services in our research: this allows for seamless, accelerated and two-way knowledge transfer between research and practice. This will support development of practice-relevant research questions, accelerate research-led innovations in practice; and lead to new avenues for joint working and funding.

c. People

Staffing strategy

Our approach to staffing policy centres on the support and advancement of existing and new researchers with a particular focus on those with clear leadership potential (so as to identify and facilitate growth or peaks of excellence as per strategy).

Research Leadership

Growing the already strong research leadership has been our focus to ensure effective research structures and policies. Over the period ten existing staff have been promoted to *Professorial Chair* (5 women/5 men) and all hold positions of strategic leadership that influence School and College research policy (Head of School, Associate Head for Research and Innovation, Research Group leaders). All are members of School executive teams ensuring research excellence influences other aspects of University business. Four staff were promoted to *Reader* and were directly supported in terms of both opportunities for further leadership (e.g. of a research group) and mentorship from more senior staff. Two of these were subsequently internally promoted to Chair - **Prof Ormandy** for her seminal work on health information and social media and **Prof Hardiker** for work on technical standards for health care which has significant international impact (see Impact Case Studies). Both have accepted wider leadership roles in the development of a University digital health strategy.

Recruitment to staff vacancies at all levels is reviewed to reflect new and future priorities, and

senior researchers serve on recruitment panels. New Chairs must have demonstrated excellence in personal research aligned to our strategic targets. **Prof Baker** joined from the Murdoch Children's Research Institute in Melbourne in 2010, and is a world leading expert in clinical gait analysis, and leads gait analysis research and clinical NHS services. This appointment supported growth in research programmes led by **Jones** and **Kenney**, further supporting their own professional development (to Readership). **Prof Hollins-Martin** joined the University in 2011 to spearhead midwifery research and **Prof Astin**, a leader in research around cardiovascular care, joined early in 2013 from the University of Leeds. **Prof Granat** joined early in 2013 to embed physical activity outcome measures in a wide range of real world research domains, directly supporting the expansion of existing research groups (from Health and wellbeing in the workplace (**Prof Dugdill**) to Knee and injury (**Jones**)). All Chairs and Readers in the College whose work falls within scope are included in this return.

Staff development and management

University wide academic role descriptors were introduced in 2012 making research expectations of all staff explicit. All senior lecturers, for example, are expected to "undertake independent research with demonstrable impact". It is assumed that Professors will be the principal drivers of research and this is monitored through the central Professorial PDR process managed directly by the Vice Chancellor and implemented through the Head of School and/or Associate Head of Research (**Profs Hardiker and Hogg**) to ensure alignment with School and University priorities. Research income, research student supervision, publication and external visibility targets are reviewed as part of this annually process and linked to salary progression. The process also allows plans to draw down appropriate University support. **Prof Nester**, for example, was supported by staff in the University Partnerships Team to extend clinical work to involve commercial partners leading to awards of £975k, £330k and £165k. The University funding team also manage all aspects of the 3 EU projects he has attracted (SSHOES, SMARTPIF, and SOHEALTHY).

Other staff are managed through the annual PDR process embedded within the line management system. All have an allocation of 10% for Scholarly Activity. Staff who are particularly active in research have research group leader input to their PDR and additional time allocations set against clear School level targets aligned with a specific research group. Such allocations are for research leadership, externally funded projects, research student supervision, publications, external presence or completion of their own PhD.

This ensures that research time is appropriately allocated and focussed to implement College and School research strategies and offer support and opportunities for the staff concerned. Being a member of a research group allows academic staff greater internal and external visibility, active participation in the development of research group strategies, access to senior research leaders and provides a portal to other research groups and external collaborations. It also encourages staff to align their research interests with School priorities. For example, **Herrington** has focussed on the knee research group led by **Jones** (rather than a prior interest in shoulders), and **Pearson** has refocused on knee and foot tendon injuries (led by **Jones** and **Prof Nester** respectively), enabling both staff to gain access to more PhD student supervision, internal and external funding, and publication opportunities.

The College has a long history of investment in early career researchers by appointing them to permanent and 100% research posts. In 2010, the University was one of only 10 institutions recognised by the European Commission for its work in supporting the professional development of researchers through the *Concordat to support career development of research staff* and this played an important role in the University retaining the European Commission HR Excellence in Research Award in October 2012.

There are now eleven 100% research posts across the College. **Hollands** was appointed and

more recently promoted (to Senior Research Fellow) to bolster links between movement science and clinical rehabilitation research. **Williamson** was appointed to a new role to promote user involvement in research across the College. This has now progressed to a contracted user engagement role within the NIHR Research Design Service for the North West. **Kenney** was promoted to Reader, and 6 of the 8 Chair promotions were previously employed in 100% research posts. This demonstrates our long term commitment to the individuals concerned, a policy of enabling those with appropriate skills and capability to develop, and prospective financial investment in research growth.

Staff wishing to do a PhD have been strongly supported. By 2012 all College staff had been given the opportunity to put themselves forward for consideration for PhD registration and support. Staff can use either traditional thesis route or PhD by published works (preferred). In all cases 20% research time and supervision teams (very occasionally external to the University) are identified and progression monitored through PDR and normal PhD student milestones. Staff are supported through access to the same formal training offered to other Doctoral students. In total 29 staff have completed their Doctoral studies in the REF period, 23 are currently registered for research degrees (15 PhD, 5 MPhil) and a further 21 are formally recognised by their School as working towards PhD by published works.

Time for publications has been supported both through an **annual Writing Week** for all academic staff (research active or not), when all other academic duties are suspended and through related **'protected time' writing workshops**. The aim of both approaches is to create quality time for all staff to engage in scholarly activity but particularly to encourage active participation in research dissemination. A **Writers' Peer Support Group** further supports staff publication activities on an on-going basis.

The College operates a **unified research bidding process** to ensure that any proposed bids are aligned with the strategic direction of the College (via approval by research group leaders), are of sufficient quality, and are financially viable. There are rolling bidding plans for all research groups— bids planned, in preparation, submitted, accepted, rejected – and training is available both centrally and locally through bidding and bid recycling workshops.

Mandatory training for all PhD supervisors aims to improve supervision capacity and capability (87% of the 65 PhD supervisors attended updates within the last year). This includes equality and diversity and widening participation issues. Senior staff are encouraged to enhance their knowledge and experience of the PhD process through serving as **independent chairs** for PhD vivas and training has been developed to support this.

Investment in staff research activities

There are several schemes to directly support staff research. New and more junior staff academic staff are encouraged to apply to the **University Vice-Chancellor's Early Career Researcher Grant**, which provides financial support for research activities. 14 individuals, including **Hollands, Thies, and Mottram**, have benefited from this scholarship during the REF period. A total of 45 **Summer Research Studentships** have been awarded to staff, funding 10 weeks work by a student on a specific research project (£72k investment in the REF period). This has enabled staff to collect pilot data for funding proposals and develop new publications. The **Graduate Teaching Student Scheme** (fully funded PhD scholarships with some combined teaching duties) allows reduction of the teaching workload on research active staff and builds capacity within the research groups. 28 have been awarded in the REF period at a cost of £1.4M. These have been invested to embryonic areas (e.g. acute care, midwifery, diagnostic imaging, social policy), to support new Chairs, and to lever external funds (e.g. joint studentship with La Trobe University, Australia, another with an NHS trust).

Principal Investigators have 25% of all the University overheads on external grants allocated

to a **Discretionary Account** to be spent in consultation with their Head of School. Over £250k has been allocated to staff in this way during the period, enabling them to extend contracts for fixed-term staff, invest in collaborative PhD studentships with other institutions, purchase small items of equipment, and develop new relationships through conference attendance and networking visits. Research group leaders are encouraged to spend such funds to support group as well as personal development. Requests for support towards **conferences and other networking activities** are channelled to strengthen strategically important activities.

Postgraduate Research Student Support

Postgraduate research (PGR) students and their activities are managed by a PGR Coordinator within each School (**Brettle, Williams**) who report to the relevant Associate Head for Research. The aim of these posts is to provide management of a seamless and high quality student experience from first contact with the University through to graduation.

There are diverse PhD modes/pathways which enables us to recruit the maximum number of students. These include full-time, part-time, split site and PhD by submitted works. The flagship Professional Doctorate programme began in 2004 and has recruited an average of 10 students per year over the REF period. We have recently launched an online programme which allows students to be based overseas and receive full supervision from the University.

PGR student recruitment has been a target for improvement over the REF period and PhD entrants have increased from 9 in 2008/9 to 24 in 2012/13. Prospective students are connected directly to research group leaders during their initial contact to ensure their research ideas align with those of the groups. This also ensures that students work alongside active researchers rather than alone, offering greater support, training and resource opportunities. Many PGR become partly or wholly funded by external research grants to support their studies. Supervision teams are then established marrying the research topic with supervision capacity and experience. All students are allocated two academic supervisors and a Personal Tutor but also interact strongly with research fellows and other staff. The University requires a minimum of 10 documented supervision meetings each year, but our students frequently experience double this, especially in their first year.

Research degrees are governed by the University regulatory framework for progression. Students are required to meet three formal milestones in order to proceed – the **Learning Agreement**, completed with their supervisors within three months of registration (to confirm their broad research plan, training and development needs and timeline); b) the **Interim Assessment**, at month 10 (or equivalent for part-time students); c) the **Internal Evaluation**, at month 23. These are accompanied by annual progress reports by supervisors and self-evaluation documents by students, overseen by the School's PGR Coordinator. Compliance with these milestones and annual reports is high and reached 100% in 2012-3. The success of this targeted progression framework can be seen in the rise in PGR degree awards which has trebled over the REF period (to 22 in 2012-13). We also have close working links with the North West hub of Vitae, which is committed to working with universities, supervisors and other national organisations to support doctoral researchers.

The University, College and School all provide appropriate development in generic and subject-specific skills for PGRs. The University Research and Innovation unit provides generic training through its **Salford Postgraduate Research Training** programme (**SPoRT**) which is aligned with the national Researcher Development Framework. Workshops cover aspects of doctoral study (e.g. expectations at different progression points, "surviving the viva"), introductions to core research skills (e.g. making a presentation, writing conference papers, getting published) and to key methodological approaches and software (e.g. interviewing techniques, focus group research, NVivo and SPSS). This programme has grown significantly since 2008, with the number of annual sessions offered rising from 51 in 2008-9

to 76 in 2012-13; participant numbers have increased 75% over the same period.

The College 30 credit (300 learning hours) level 7 **Research Methods module** is compulsory for PGR students who do not have equivalent prior experience. There is an active programme of research seminars at College, School and Research Group level allowing a range of opportunities for students to hear visiting and local speakers and to present their own research. This starts with the College-wide “**Getting started**” week. College level PGR support is now managed through a single site within the BlackBoard virtual learning environment, which also serves as a tool for records of supervision meetings.

The University also runs the **Salford Postgraduate Annual Research Conference (SPARC)** at which students and early career researchers across the disciplines can present their research and gain feedback. SPARC has run for over 12 years and attracts students from many other institutions including the Universities of Reading, Bristol, Exeter, and the Open University. The aim of the programme is to assist researchers in developing effective research skills as well as transferable skills to enhance employability. The programme maps fully onto the national Researcher Development Framework (RDF). PGR students have access to all of the facilities given in section d below.

A specialist adviser on PGR careers is available within the College. More generally, the Students’ Union elects a dedicated postgraduate Vice-President (two Union Presidents since 2008 have been postgraduates). 56% of PGR students responded to the **Salford University Programme and Learning Evaluation (SUPLE)** survey last year. 79% agreed or strongly agreed that they were satisfied with the quality of their programme. All full time PGRs receive a personal desk space (59 in total) and associated PCs and storage. Part-time students are rarely based on campus for more than half-days but have access to multiple open access areas (>50 spaces) and can hire laptops. Part-time students that visit for several days (e.g. if from overseas) are provided with their own desk space.

Postgraduate Research Representatives are elected from the student body, work closely with academic staff, and sit on the College Research and Innovation Committee to ensure that the voice and expectations of students are heard and acted upon.

d. Income, infrastructure and facilities

Research income

Research awards in the period exceed £7M and recorded expenditure is £5.9 million. Grants of over £50k awarded are listed below. (Quoted amounts are the full value the award to Salford and include recent awards so total more than the official REF “research spend”.) **EC Framework 7** (£365k, Special Shoe Movement, £192k Smart tools for orthotics, £240k SOHEALTHY Footwear network, Prof Nester, Preece, Prof Howard, Williams), **EPSRC** (£860k, energy efficient lower limb prostheses, Prof Howard, Kenny, Prof Baker), **Department of Health: New and Emerging Applications of Technology Programme** (£752k, FES device, Howard, Kenney, Thies, Williamson), **NIHR Research for Patient Benefit** (£246k, Visual Cues, Hollands; £244k, AFO in stroke, Hutchins; £212k, Primrose Hill Oral Health Trial) and **Invention for Innovation** (£880k, Motorised Rehabilitation Device, Prof Baker; £900k, Upper limb FES, Kenney, Prof Howard), **NHS Executive** (£75k, Promoting Cervical Screening, Prof Ormandy; £60k, Staying healthy workplace project, Prof Dugdill), **Health Technology Devices Programme** (£165k, Motorised Rehabilitation Device, Hutchins), **Royal Centre for Defence Medicine** (£150k, Amputee Gait, Prof Baker, Twiste), **International Council of Nurses** (£88k, ICNP extension, Prof Hardiker), **Children’s Workforce Development Council** (£50k, Prof Long).

Direct funding from industry includes **SSL International** (£975k, Feet matters, Prof Nester), **Reckitt Benckiser** (£290k, Prof Nester, Hashmi), **SARL** (£90k, Jones), **FitFlop** (£395k, Jones), **Unilever** (£104k, Prof Dugdill), **GlaxoSmithKline Ltd** (£100k). We have also been successful in obtaining a number of KTP partnerships with the following companies: **Reckitt Benckiser** (£193k, Nester, Hashmi), **Stockport Primary Care Trust** (£175k), **Manchester Brook Advisory Centre** (£120k, Prof Ormandy), **Medicines Evaluations Unit Ltd** (£136k), **FitFlop Ltd** (£131k) and the **BBC** (£73k) and further funding from the Technology Strategy Board (£260k, 3-d printing for orthotics, Nester).

Research funded by charities has included **Arthritis Research UK** (£395k, four projects, Hammond, £85k, Jones), **Action for Children** (£100k, Targeted family support, Prof Long), **Occupational Therapy Research Foundation** (£85k, Prof Hammond), **Stroke Association** (£71k, FES Stimulator, Prof Howard), **Kidscan** (£62k, Self-esteem and CNS tumours, Prof Long), **Asthma UK** (£50k), and the Burdett Trust for Nursing (£50k, Prof Long).

Work with local authorities includes **Salford PCT** (£155k, Mirror therapy), **Ashton, Wigan and Leigh PCT** (£85k, Stories people tell), and **Wigan Metropolitan Council** (£60k, Free swimming evaluation).

Infrastructure and Facilities

Three world class clinical biomechanics laboratories support research that investigates the science underpinning movement disorders and evaluation of related interventions and practice. Across these there are 14 forces plates, 44 motion capture cameras, 3 EMG systems, 2 plantar pressure plates, 3 in-shoe plantar pressure measurement systems, a 3D foot shape scanner, 2 ultrasound machines, 2 isokinetic testing machines, 2 thermal imaging cameras and range of skin research equipment (measuring skin hydration, elasticity, collagen organisation). One of the three laboratories is integrated with a 16 cubical clinical facility through which 10,000 foot health treatments are delivered each year. This was renovated in 2008 at a cost of £1.5M. A second laboratory has been fully renovated as part of a further £1.4M investment (2013), and is now co-located with new a clinical prosthetics and orthotics suite and a CAD/CAM and gait analysis training suite. These laboratories also house various bespoke instruments/devices built as part of research projects, usually in partnership with staff in the School of Engineering. Specific purchases using internal resources (RCIF, HEIF, SRIF) over the period to support these laboratories include: £105k Vicon motion system; £38k on Pedar in shoe system; £15k on Kinepro Wireless EMG; £25k Qualisys system; £31k Biopad EMG/EEG; £56k on ultrasound. Externally funded projects have provided a further investment valued at £90k in various pieces of equipment.

The Salford gait laboratories are a recognised satellite facility of the NIHR/Wellcome Trust Central Manchester Clinical Research Facility (WTCRF). This reciprocal arrangement allows access to our laboratories for researchers in the WTCRF, but also provides additional capacity for our research in their building in Manchester. We are the primary providers of training and research protocol support for biomechanics research at WTCRF. A new imaging suite was opened in 2011 and includes one of the few 16 slice CT scanners available within British universities. A £55k Agfa Computed Radiography facility has recently been installed.

e. Collaboration and contribution to the discipline or research base External leadership and presence

The College has a number of staff who are world renowned in their respective fields. **Prof Nester** (Podiatrist, h-index = 11) has attracted over £4.5M and published over 70 journal papers in his career (34 since 2008) with notable contributions on the knowledge of foot biomechanics and orthotic effects. He co-founded i-FAB, the International Foot and Ankle

Biomechanics Community, which now has over 700 members from 45 countries. **Baker** (h-index = 20) joined the University in 2010 from Melbourne where he had directed the Australian National Health and Medical Research Council Centre for Clinical Research Excellence in Clinical Gait Analysis. He has attracted over £4.8M and published over 80 journal papers in his career (36 since 2008) and is Associate Editor of *Gait and Posture*. He is particularly well known both for innovative approaches to measuring and modelling human walking and for a series of definitive outcome studies on a range of interventions to improve walking ability in children with cerebral palsy. **Granat** (h-index = 19) joined the University in 2013 and has published over 70 journal papers in his career. He is a leading international authority on activity monitoring and its applications. **Hammond** (occupational therapist) (h-index = 16) is a leading international rheumatology rehabilitation researcher. She has published over 50 peer-reviewed articles and book chapters and is co-editor of "Rheumatology: Evidence based Practice for Physiotherapists & Occupational Therapists" (2010, Elsevier). **Hardiker** (Nurse) (h-index = 7) is a leading international expert on nursing and health informatics, with a specific focus on terminologies. He has published over 30 peer-reviewed articles and book chapters. He is Director of the International Council of Nurses eHealth Programme, is Editor-in-Chief of *Informatics for Health & Social Care* and has played a leadership role within a number of national and international policy and professional groups (BSI IST35, CEN TC251, ISO TC215, NHS Connecting for Health, US Nursing Terminology Summit, HIMSS Europe, IMIA NI, WHO Family Development Committee).

Staff within the College serve as Editor-in-Chief on three peer review journals, are Associate Editor on another 9 and are on the Editorial Boards of a further 16 international journals. Staff are serving or have served on numerous grant committees, with notable examples including British Renal Society, European Dialysis & Transplantation Nurses Association, European Renal Care Association, NIHR Evaluation, Trials and Studies Coordinating Centre (College of Experts), NIHR Research for Patient Benefit, NIHR Health Service and Delivery Research, NIHR Health Technology Assessment, Arthritis UK, Health Research Board, Ireland, and Australian National Health and Medical Research Council.

Collaborations

External collaborations are extensive and very well established. For example, 89% of outputs submitted to REF 2014 recognise co-authors outside the University of Salford (8% EU, 18% outside the EU). Externally funded projects have been in partnership with 17 different UK universities and funded partnerships involve 5 EU Universities, 3 EU companies, the Universities of Miami and California and the Fujian Medical University. Dr Karen Mickle from Wollongong University was awarded the prestigious Australian NHMRC International Fellowship spending 2 years with **Prof Nester** on foot problems in older people. Visiting PhD students have studied for periods of 3-12 months from Shanghai Jiao Tong, Padova, Beijing Sports and Valencia Universities. **Prof Hammond** has strong collaborations with the Netherlands, Austria, Sweden, Canada and the USA.

Partnerships with clinical services are likewise very well established. Collaborative externally funded projects include 9 different NHS trusts (PCTs and Foundation Trusts). Examples of joint working include jointly funded PhD studentships, research-led contributions to national guidelines (e.g. footcare in rheumatoid arthritis, **Williams**, EULAR recommendations for nursing in chronic inflammatory arthritis, **Prof Hammond**), working through Trusts and UKCRC Registered Clinical Trials Unit networks for participant recruitment and trial management (**Prof Hammond, Hollands**), and the inclusion of clinicians from more than 20 different NHS organisations in focus groups to scope current service models to underpin orthotic tool designs. **Prof Nester** has recently established a "gather field" of >20 Podiatrists from across the UK to regularly participate in research study designs and studies (e.g. focus groups), to embed current practices in their research. **Prof Hammond's** EDAQ and VLAS

projects included over 20 trusts and 7 patient organisations.

We have particular strengths in patient and public involvement (PPI) in research under the leadership of **Williamson**. Service users routinely contribute to research design and many actively engage in the conduct of studies usually in a substantive advisory group role and evidenced by dedicated work packages for PPI. Our PPI activities follow several best practice guidelines (e.g. *INVOLVE 2013 Briefing Notes for Researchers*, and the on-line *PPI How to Guide* for the NIHR, both co-authored by **Williamson**). For example, the public are rewarded for their contribution, paid in cash on the day and have their development and support needs met. The User Carer Forum established in SNMSW in 2005 is still active in sharing members' experiences to develop pre-and post-registration students and inform research activities.

Industry partners **Reckitt Benckiser** have sponsored 3 iterations of funding totalling £1.4M which underpins their development of internal skills and knowledge, product data and innovation activities. **INESCOP** (Spain) are arguably Europe's leading footwear technical R&D centre and have been partners in over 10 EU project proposals and partners in 4 funded projects. They have a memorandum of understanding with SHS recognising the long standing relationship and good strategic alignment. Through EU projects submitted staff have worked with over 30 EU project partners from a variety of disciplines across more than 12 EU countries (clinical services to software development to IP management).

Conferences

The College has hosted a number of national and international conferences: 1st International Interprofessional Health and Social Care Conference, 2008; Clinical Movement Analysis Society, 2008; 2nd International Inter-professional Health and Social Care Conference: Learning Better Together, July 2010 (with Manchester Metropolitan and Manchester Universities); 6th Evidence Based Library and Information Practice Conference, 2011.

Interdisciplinary research

Research within the College of Health and Social Care is highly interdisciplinary. Clinical staff submitted to REF 2014 include nurses, midwives, physiotherapists, occupational therapists, podiatrists, prosthetist/orthotists and radiographers. Also submitted are mechanical engineers, a physicist, sports scientists, information scientists, a kinesiologist and a statistician all engaged on research within the scope of this UoA. 60% of outputs submitted to REF 2014 recognise co-authors from fields outside Allied Health or Nursing and many represent collaborations between staff in different areas within allied health or nursing.

Research informed learning

Research group leaders are also responsible for **bringing research into the classroom** for example through the development of new research-informed modules such as 'End of life care' led by **Prof Johnson**. **Profs Baker and Johnson** have obtained separate funding (€400,000 each) from the EU Lifelong Learning Programme to establish joint master's degree programmes in **Clinical Movement Analysis** and **Dementia**. **Prof Nester** leads the EU funded SOHEALTHY International Cooperation project (£240k), which seeks to develop education and research strategies for the footwear sectors based on best available research evidence. We have led two EU funded intensive lifelong learning programmes: **HUROPEL**, Human rights: Older People and End of Life Care and **EURADAR**, Recognition of the Acutely Deteriorating Patient with Appropriate Response.