Institution: Brunel University

Unit of Assessment: 3 - Allied Health Professions, Dentistry, Nursing and Pharmacy

a. Context

Our research has a wide range of non-academic users with the main national and international groups and beneficiaries being: the general public, health and social care professionals (pre-registration students, practitioners and managers), clinical and social care providers, commissioners and policy makers (e.g. the NHS, professional bodies, governments); service users and those who support them (e.g. patients and carers). Our work also has significant benefits for international organisations concerned with shaping and promoting research priorities in science, health and social care (e.g. the pharmaceutical industry, EU research commissioners, Research Councils) and deep reaching effects for those engaged in promoting the quality of health and social care services (e.g. Charities, Social Care Institute for Excellence, Cochrane Collaboration and National Institute of Health and Clinical Excellence). Our research is facilitated through three divisional research leads: Biosciences led by Kill, Occupational Therapy led by Harries and Physiotherapy led by O'Connell. Within the University, academics collaborate across divisions through the School's five Research Centres as well as the University wide Ageing Collaborative Research Network; these facilitate our interdisciplinary work and speak to ongoing debates in science, practice and policy. There are strong links with other research groups, key stakeholders and clinical and social care practitioners as evidenced through jointly funded collaborative projects, for example Harries obtained funding from Imperial College to jointly research referral priorities to acute dietetics services and McIntyre obtained funding from the South West London NHS Mental Health Care Trust to jointly research the experience, for older people with dementia, of having falls. **Biosciences' impacts on health** have been achieved through scientific advances in the identification and characterisation of new genes and molecular pathways involved in human ageing and diseases and the development of novel diagnostics and therapeutics necessary for the development of public health programmes and clinical interventions. **Impacts on the economy** have been achieved through influencing the direction of funding for research. **Impacts on society** have been achieved through raised public awareness of specific medical conditions and their health related risks. These three types of impacts have resulted from research into: progeria (premature ageing) (Kill, Bridger,Tree); breast, prostate and skin cancer (Newbold, Harvey, Bridger, Parris); leukaemia (Dick); tuberculosis (Tsolaki, Pathan); aspergillus infections (Tsolaki, Kishore); neurodegenerative diseases (Pook); irradiation aberrations (Rudolph, Slijepcevic, Anderson); normal ageing (Kill); Makarov regulation of transcript splicing gene therapies (Themis, Pook); pre-eclampsia, endocrine disorders (Karteris and Rand-Weaver); arthritis (Stenbeck); peptide-edited microscome vaccine (Li); pathan-host pathogen interactions (Bridger, Vagnarelli); diagnostic testing for radio sensitivity (Parris); molecular mechanisms of cellular polarity (Hofken); regulation of mitotic exit (Vagnarelli); influenza and HIV infections (Nal-Rogier); bacteria as a model for human disease (Rudolf); neuroblastoma (Sala); and systems and synthetic biology (Saunders).

The Occupational Therapy and Physiotherapy impacts on health and welfare have been achieved through the development of healthcare guidelines and improvements in professional practice; **impacts on practitioners and services** have been achieved through enhanced workforce planning based upon raised awareness of health and social care service user needs and the production of web-based clinical decision aids, clinical pathways, practice guidelines, technologies and CPD resources. These impacts have improved the quality and efficiency of service delivery and enhanced evidenced based education, policy and practice. These impacts are derived from research into: detection and prevention of elder financial abuse (Harries); health and safety in extended working lives (Reynolds); postpolio syndrome (Atwal, Spiliotopoulou); simulating the home at the hospital (Atwal, Spiliotopoulou, McIntyre); home based palliative care (McKay); community mental health (Harries, McKay); experiences of mental illness (Blank, Prior, McKay); International Classification of Functioning, Health and Disability (Tempest, McIntyre); behaviour and autism (Nikopoulos); home visiting practice (Atwal, Plastow, McIntyre, Wilson); amputation rehabilitation (Atwal, Spiliotopoulou, Jayakaran); culture and disability (Lim, Kramer-Roy); outcome measures for assessing Dupuytren's disease (Pratt); creative therapies (Reynolds, Wilson, Blank); dementia and falling (McIntyre); cerebral palsy (Ryan); electrically powered

wheelchairs (De Souza); hyperventilation (Jones, Harvey, O'Connell); muscle innervation (Nowicky); chronic and low back pain (O'Connell, Cossar, De Souza); Bronchiectasis (Harvey) and stroke (Kilbride, Tempest, Norris).

b. Approach to impact

Academics in the UoA are clinical therapists and clinical scientists; the very nature of our research is driven, therefore, by a desire to enable practitioners to deliver optimal health care services. We strive to undertake basic and applied research, with clinically translatable value, in order to advance health technology procedures, work force capacity and health care practice.

Institutional support to enable impact: Our University's Royal Charter of 1966, stated that research would be *for the benefit of individuals and society at large*. Developing impact is an essential component of Brunel's core mission and strategic plan (2013-17) and, as such, it serves as a guiding principle of our research activities. Measures to support this include a Brunel-wide knowledge exchange programme (used by Atwal 2009/10 and Tempest 2011/12), training in the use of Brunel's *Impact Planning and Review Toolkit*, expertise and advice on how to liaise with funding bodies, charitable organisations and industry, provided through the University's Research Support and Development Office (RSDO) and an external PR consultancy to support staff media engagement. 'Understanding Impact' forms part of the training for all new staff. Colleagues on the University Future Research Leaders scheme require evidence of impact-related research and engagement, as do those applying for promotion. A competitive University research leave scheme includes impact as an evaluative criterion. The knowledge transfer leave programme provides funding to cover teaching and administrative duties while the member of staff carries out a KT project, and the Walduck Prize is awarded by the VC to the doctoral research student whose work has had the greatest public benefit.

Development of evidence based training resources, diagnostics, assessment technologies and therapeutics: Where scientific advances have the potential to be of benefit to public health programmes and clinical or social care practice, researchers have proactively sought pathways to impact. Banning's research on the employment needs of women following breast cancer were highlighted and disseminated as a valuable evidenced based resource by Breast Cancer Care; the resource supports employers to optimise health outcomes through return to work procedures. Anderson has characterised chromosome aberration complexity as an important indicator of exposure to alpha-particle radiation from environmental (radon gas) or occupational (nuclear industry) radiation; the identification of exposed individuals has important implications for understanding radiation-induced disease and risk management, as evidenced through her expert consultant role in the litigation case: Hickman and Rose: M-FISH testing of Australian nuclear test victims (2010). Parris has developed a method for assessing sensitivity to radiotherapy therapeutics; this has been trialled with clinical samples and welcomed as a novel and important screening test to identify those who may be highly sensitive to certain types of radiotherapy. Pook's research, which successfully developed the first genetically modified mouse model for Friedreich's Axatia, has facilitated the commencement of four different international multi-centre clinical trials. Positive outcomes from these trials will allow effective medical interventions to be prescribed which will ameliorate the disease pathology; such advances will dramatically improve and extend the quality of life of people with this very disabling neurological condition.

Links with research users are developed and sustained: individuals, research divisions, research centres and the collaborative research network have used a range of measures to form partnerships. Health and Social Care professionals and service users are encouraged to identify their own priority areas for research (which, for example, have then been taken up by postgraduate or doctoral students and used to develop collaborative research bids). For example, at the request of the acute stroke service team at the Royal Free Hospital NHS Foundation Trust, Tempest undertook an action research study, to examine the process and outcome of implementing the International Classification of Functioning. This resulted in the development of a new team discharge report, which the stroke team and recipients' of the report (stroke survivors, their families, carers and community therapists) identified as a means of providing a more effective communication about the patient's status and on-going needs. Research users have easy access

to on-going research being conducted within the School, through a series of public lectures, presentations and master classes which have been delivered jointly with domain experts: at Brunel (e.g. Lim with Iwama from Canada) or within the community of interest e.g. Hillingdon Science Fair (e.g.Kill). Our service user advisory groups e.g. Brunel Older People's Reference Group ensure grants related to older adults are planned, conducted and disseminated with public and patient involvement.

Identification and facilitation of the use of effective clinical procedures and interventions: we have conducted rigorous systematic reviews to identify effective clinical interventions; a range of funding and regulatory bodies have been instrumental in partnering these reviews e.g. the Cochrane Collaboration, National Institute for Health and Clinical Excellence, professional bodies (e.g. College of Occupational Therapists and Chartered Society of Physiotherapists) and key stakeholders (e.g. Ataxia UK and British Thoracic Society). The Brunel knowledge exchange programme has been used to create some of the pump priming funding and support systems to promote these partnerships. Following the completion of the reviews, impact has been created through the development of a range of evidence based practice guidelines e.g. occupational therapy for lower limb amputations (Atwal, Spiliotopoulou); provision of splints (Pratt, Kilbride) management of neuropathic pain (O'Connell); physiotherapy treatment of cerebellar ataxia (Kilbride, Cassidy); physiotherapy management of the adult, medical, spontaneously breathing patient (Harvey) and management of non-cystic fibrosis bronchiectasis (Harvey). These guidelines, launched at public events with service users and stakeholders, have directly benefited clinicians by providing the research base to support practice. They have had important international impacts on patient care through facilitating services to deliver effective interventions.

Shaping the direction of international health and social care policy through strategic collaboration: we have been invited to hold positions in a variety of policy forums; Ministerial advisor to Health and Social Care Professionals Council, Ireland (McKay); Member of the ESRC peer review College (Harries); External Reviewer of Australian occupational therapy professional competencies (McKay); expert consultant to the Department for Transport's Blue Badge Scheme for disabled drivers (Harries, Kilbride); Member of the College of Occupational Therapists' working party on electronic record keeping (McIntyre); Chair of the Care Development Panel of the Motor Neurone Disease Association (De Souza); Member of the Department of Health Taskgroup on Health Informatics for Allied Health Professions (De Souza); Chair of the Association of Radiation Research (Anderson); Member of the Forum of Mobility Centres Expert Research Panel (Harries); Lead national physiotherapist on the Intercollegiate Stroke Working Party - Royal College of Physicians, member of European NeuroRehab Guideline Development Group (Kilbride), consultant to the Pakistan Ministry of Science and Technology (Banning); advisor for the External Devices and Physical Therapies Panel of the Health Technology Agency (De Souza).

c. Strategy and plans

One of the eight imperatives of the School I[8] Strategy and Action (2012-2020) is 'Impacting'. The research centre directors, the School Impact Champion and the divisional research leads will continue to work with the Deputy Head of School (Research) to co-ordinate the implementation of the impact strategy through the Impact Management Executive Working Party (IMagE); this will include promoting our research impact through three main measures:

Ensuring all grant applications contain excellent 'pathways to impact': Research proposals will be developed, more extensively, with interdisciplinary service providers and patient involvement; this will ensure that clinical and social care providers, service users and their carers are involved in planning pathways to impact that will directly address people's health and lifestyle needs. For example Spiliotopoulou, who recently obtained funding to research best practice in the successful fit of minor assistive devices, will collaborate with the Polio Society and Disabled Living Foundation to take the findings forward into NICE accredited occupational therapy practice guidelines. These will, in turn, directly impact on policy and practice in the UK. Benefits to services and communities, identified from the outset through funding application impact pathways, are thereby ensured.

Facilitating the translation of research findings into policy and practice: We will strengthen and broaden our collaborative partnerships with policy makers and those who influence practice delivery. For example, Harvey will extend her current partnership with the British Thoracic Society

to include the Department for Health; this will extend her research, which has already underpinned the Guideline for management of non-Cystic Fibrosis Bronchiectasis, into the development of a care pathway and model service specification. Care pathways determine patients' day-to-day care, ensuring the workforce deliver effective evidence based practice to service users.

Utilising the internet, media and social networking to facilitate and evaluate our international impact: We see new communications and social media technologies as ideal mechanisms to share research findings and best practice globally; knowledge exchange and transfer in new territories will be facilitated and evaluated. Our Open Access Mandate and Publishing Fund support free access to research by potential users and help promote the serendipitous creation of impact. The recent success of our involvement on national and international panels will be built on by providing further opportunities to present research findings to various stakeholder groups in the policy and practice domains. Our web based training resources have been used internationally to support the development of best practice. For example Harries, recently funded to collaborate with Australasian experts, will develop, test and launch a web-based decision aid to assist occupational therapists to make optimal clinical fitness-to-drive decisions. We will increase the sharing of our own research, through our teaching, master classes, public lectures, and the hosting of international conferences, in order to increase the impact of research on future generations of policy makers.

d. Relationship to case studies

Harries' case studies on enhancing professionals' decision-making abilities (referral prioritisation and elder financial abuse), fits with our approach to the **development of evidence based training resources**. In keeping with our future strategy, Harries will be working with representatives of the Dementia Friendly financial services sub group of David Cameron's Dementia Challenge to shape policy and practice enhancements for vulnerable older adults. This will fit with our plans **to facilitate the translation of research findings into policy and practice** and to achieve **excellence in our pathways to impact**. Kill's and Bridger's case study utilised Brunel's **institutional support** for the financial sponsorship and formation of a research group into Progeria research. They **effectively developed and sustained research user involvement** to bring together sufferers, clinicians and researchers internationally. Going forward we plan to continue to use the worldwide media to draw attention to their research findings in order to facilitate continued impact. De Souza's three case studies (back pain, multiple sclerosis and EPIOC), illustrate how we have achieved impact through the **identification and facilitation of effective clinical procedures and interventions**. The research has impacted upon the delivery of optimal patient care by shaping the development of international guidelines and policy documents. We plan to extend our **media and social networking strategies** to maximise this type of impact, e.g. O'Connell will continue to contribute to, and act as a section editor for, a regular blog on contemporary pain research to ensure research evidence is accessible to clinicians (www.bodyinmind.org , which has more than 3000 website hits a week).