



**Birmingham
Community Healthcare**
NHS Foundation Trust

Research and Innovation Annual Report 2018 – 2019

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Executive Summary

Research and Innovation (R&I) in BCHC continues to grow from year to year. Performance against the NIHR Higher Level Objectives continues to be very good resulting in over performance against our Trust target.

We continue to work closely with the West Midlands Clinical Research Network (CRN) and were pleased to receive a Highly Commended – Best Overall Performance Award 2018 and an award for our contribution to research in the area of older adults. We were pleased that the MSK service also received an award as Service Runners up in the New Research category for the two clinical trials conducted. The Innovation Manager was also nominated and shortlisted for a Value In Practice award in recognition of his activity.

Two NIHR awards (HTA and Programme Grant) totalling £3.5 million have been granted to BCHC. The funds are specifically for research costs however some Research Capability Funding (RCF) will also be attributed to our Trust. We have also experienced success with strategic funding applications to the CRNWM to build research nursing capability. We also acknowledge the success of one of our paediatricians who won a 2 year CRN Clinical Scholar Award.

The gradual but intentional shift from externally defined research to research generated within and with direct relevance to BCHC patients continues. The impact of this is seen in the Outcomes and Impacts of Research section of the report. Patients and carers will be significantly involved in all future research and innovation projects; a greater focus on developing involvement has begun.

CHART is a national Community Healthcare Alliance of Research Trusts and was initiated by BCHC. This has gained national attention from the NIHR, CRN and AHSN and other organisations. The alliance will be an operational tool to share best practice, share information and provide a platform for generating new bespoke research within a community setting. Individuals are encouraged to follow CHART on twitter @CommunityHART

The innovation function is well established within the R&I team and the Virtual Innovation Forum remains a way in which staff can engage with the team, present ideas and comment on others. Innovation Engine 2 was a European Regional Development Funded project led by Innovation Birmingham. The aim was to provide Business Assistants to Small to Medium Enterprises, the project came to a successful end this year with BCHC playing a significant role within the partnership.

Previous collaboration with Surrey and Borders partnership NHS Foundation Trust has led to a new and exciting Test Bed opportunity which will be reported in detail next year.

Financial sustainability remains a challenge however; Within the new R&I strategy embedding research and innovation into the Trust is key for significant change to occur. Research and Innovation awareness, training and engagement/collaboration are essential steps for building a robust future within the organisation.

Finally, the R&I team would like to acknowledge the hard work of our researchers and thank all staff who engaged in or supported research and innovation activity.

Outcomes and Impacts of Research

Outcomes

Researchers Details and Division	Title	Research Outline	Findings
<p>Dr Beryl Oppenheim (Consultant Microbiologist) Urgent Care</p> <p>Collaborations: Loughborough Uni and Wolverhampton NHS</p>	Reducing misdiagnosis of urinary tract infection in the elderly	^ The study is looking to reduce the misdiagnosis and antibiotic prescribing practices of the diagnosis, management and treatment of urinary tract infection in older people.	<ul style="list-style-type: none"> For detailed findings see last year's report The study was mentioned in a Radio 4 Science discussion The diagnosis and treatment of UTIs in those over 65 is one of the quality indicators the commissioners of healthcare can ask its local providers to audit themselves against for 2019-20 (called 'Commissioning for Quality and Innovation' CQUINs): https://www.england.nhs.uk/wp-content/uploads/2019/05/CCG-CQUIN-1920-Indicator-Specifications-070519.pdf) The National Project Lead for Antimicrobial Resistance for NHS England and NHS Improvement; are citing the ARIC paper
<p>Children and Families</p> <p>Sadie.Bell@lsh.m.ac.uk Chief Investigator</p>	Understanding and improving vaccination uptake and health service access amongst recent migrants from Poland and Romania: A qualitative study.	Interviews with migrants from Poland and Romania	<ul style="list-style-type: none"> Evidence suggests that specific actions should be taken to facilitate access to immunisation services by Eastern European populations, including clear signposting to navigate the NHS, providing credible vaccination information in translated forms, allowing sufficient time for vaccination appointments; and supporting health care workers to manage differences in immunisation schedules. To reach underserved groups (e.g. Roma communities), key agencies should work together to actively engage with communities and thus reduce the occurrence of outbreaks. Culturally sensitive vaccination services, which can respond to linguistic and cultural diversity, and different service user expectations of health services, are needed to optimise vaccination coverage amongst migrant and ethnic minority communities Bell, S. (2019). 'Exploring vaccination beliefs, attitudes, and behaviours amongst Polish and Romanian communities in England' [oral presentation], paper presented at the Public Health England National Immunisation Network
Children and Families	Describing and specifying pre-	A Qualitative	<ul style="list-style-type: none"> One hundred and ten respondents from 58 different NHS organisations across the

Researchers Details and Division	Title	Research Outline	Findings
	appointment written materials as an intervention: a survey of pre-appointment materials used by children's therapy teams in the UK	analysis investigation of pre-appointment materials that may shape expectations related to the service using	<p>UK completed a survey about pre-appointment written materials in children's therapy services.</p> <ul style="list-style-type: none"> The research also mapped children's therapy services across the UK and their key characteristics. This is the first dataset of its kind related to children's therapy services. The research findings provide a description of current pre-appointment written materials as an intervention i.e. the theoretical targets and change processes of the materials. Services and therapy teams can use the research findings to improve and/or develop the written materials they use routinely in clinical care and service delivery.
<p>Community Services</p> <p>Mr Kumar Nag (BCHC Lead)</p> <p>Chief Investigator S Parveen Bradford University s.parveen27@bradford.ac.uk</p>	Obligation, Willingness and Preparedness to Care: The Caregiving HOPE Study	The aims of the study were to explore the impact of cultural obligation, willingness to care and preparedness to care on the wellbeing of carers of relatives living with dementia.	<ul style="list-style-type: none"> The findings of the study are now live on our website https://www.bradford.ac.uk/dementia/research/caregiving-hope/ Not surprisingly South Asian carers felt more culturally obligated to provide care, HOWEVER White British carers were found to be more willing to provide emotional and nursing care. Both groups were equally willing to provide practical (cooking, cleaning) care. White British carers reported feeling more confident in their care roles and also more prepared. Thirty nine percent of the carers in this study had very high levels of anxiety and 40% of the group were found to have 'clinical levels' of anxiety. Approximately 23% of carers had 'clinical levels of depression and 44% were 'borderline clinically depressed.' As an additional output; the research team has worked with the carer panel and has produced a short book containing photos and quotes from carers. The book is available as a free download from the website. Alternatively you can email me on s.parveen27@bradford.ac.uk to order a copy.
Zehra Yonel Dental Hospital	^ Screening Underlying Chronic Conditions in	A study to determine the views of patients and	<ul style="list-style-type: none"> The potential impact on patient benefit is significant, if targeted risk detection in dental practice proves feasible it may have significant health benefits in terms

Researchers Details and Division	Title	Research Outline	Findings
	dEntal SettingS (SUCCESS)	the public towards screening for common medical conditions in a dental practice setting.	<p>of early identification and intervention for type 2 diabetes. Improvements in periodontal health.</p> <ul style="list-style-type: none"> • Evidence suggests this intervention could be cost saving for the NHS. • This research has laid the foundations for a recent successful NIHR DIABETES UK doctoral research fellowship award of >£400,000.
Zehra Yonel Dental Hospital	^ Dental nurse Effecting Diabetes and Cvd Awareness Through biofeEDback (DEDICATED)	Project to determine whether there is additional benefit of provision of oral hygiene advice +/- biofeedback in general medical settings for those diagnosed with diabetes and CVD.	<ul style="list-style-type: none"> • Potential patient benefit through early identification to periodontal disease. Patients will be given advice including being advised to visit a dentist in line with the 2019 commissioning standard. • Through earlier dental intervention potential patient benefit may include improved systemic health through improved diabetic control. But also significantly improved oral health and ultimately retention of teeth and the associated psych-social and nutritional benefits associated with this.

^ Studies sponsored by BCHC

* The Sponsor takes on responsibility for initiation, management and financing (or arranging the financing) of the research.

Impact and Benefits:

The table above reflects some of the studies where BCHC has contributed to recruitment, designed or sponsored* studies. With time, the benefits of this work will be reflected in the rising levels of posters, presentations and publications within each service and a gradual increase in significant research outcomes relevant to BCHC that will ultimately improve the healthcare of patients and demonstrate cost savings. The internal impact of this work is that active researchers become empowered to use their research skills to identify new research questions; the external impact will raise the profile of the Trust as a research active organisation which will attract collaborations and offers of new research and innovation.

Research Performance against National Targets

Recruitment

In total 28 studies recruited into NIHR Portfolio studies, of which:

- 3,243 Activity Based Funding¹ units was secured (target was 1993)
- 858 patients were recruited (target was 497)

Higher Level Objectives:

Higher level objectives (applied to Birmingham Community Healthcare NHS Foundation Trust) These apply to specific studies adopted onto the National Institute for Health Portfolio	Total studies measured	Achieved?
1. To recruit 497 participants between 1st April 2018 and 31st March 2019	28	✓ 858 patients recruited
2. To recruit to target and to time	10	✓
3. To host commercial studies	0	× No suitable commercial studies were available
4. To Confirm Capability and Capacity within 40 calendar days	13	✓
5. To recruit the first participant within 30 calendar days	6	✓

Performance in Initiating and delivering Clinical Research

Performance in Initiating and Delivering Clinical Research Measure ² These apply to clinical trials. In total there are 2 measure set and these were achieved.	Total studies measured	Achieved?
1. Initiating Clinical Research within 70 calendar days	1	✓
2. Delivering Commercial Clinical Research to time and target	0	N/A No suitable commercial studies were available

¹ Activity Based Funding - This is an allocation provided to the Trust by the NIHR CRN West Midlands to support the development of the Trust's research infrastructure. The funding applies to NIHR Portfolio studies. The funding is calculated by applying a unit value to each participant recruited. Each unit will vary depending on the study Banding. ABF bands and unit: Band 1 Studies (i.e. online questionnaires) = 1 unit, Band 2 Studies (i.e. observational studies) = 3.5 units and Band 3 Studies (i.e. interventional) = 11 units.

² Performance in Initiating and Delivering Clinical Research Measure - The Department of Health has set 2 performance targets for studies defined as clinical research (studies that involve a clinical intervention). (1) Initiating Clinical Research: This measures the time taken to recruit the first patient. The benchmark is set at 70 calendar days. (2) Delivering Clinical Research: This measures whether the research team recruited the target number of participants on time and to target. This measure applies to research sponsored by commercial companies.

Finance

Income

Trust Funded Posts	£96,623	Research Capability Funding ³	£21,723
Activity Based Funding 163,165	£	Commercial	£0
Strategic Funding	£92,530	Clinical Trials Scholar	£24,720
Total	£442,607	InnovationEngine2 Project	£43,846

Outcome of funding applications made in 2017/18

Bid Title	Lead Researcher	Funding Body	Budget	Bid Outcome
Strategic funding for joint research nurse with Black County Partnership NHS Foundation Trust * and Dudley & Walsall Mental Health Partnership Trust* 1 year only Speciality mental health	Esther Hutchings Research Nurse	* Clinical Research Network: West Midlands	£37,768	Bid successful Funding allocated to Black County Partnership NHS Foundation Trust where nurse was based
0.5 WTE backfill for MSK physiotherapist to manage two portfolio research projects 1 year only	Jonathan Price Physiotherapist	* Clinical Research Network: West Midlands	£20,014	Bid successful
Research Nurse 1 year only	Research Nurse	* Clinical Research Network: West Midlands	£23,289	Not successful
Eye movement desensitisation and reprocessing for symptoms of post-traumatic stress disorder in adults with Learning disabilities	Professor Paul Willner Swansea University & Sara Willott BCHC (Learning Disabilities)	Health Technology Assessment	£1,3 million	Successfully
Christine Singleton, Clinical Specialist, Service Lead (BCHC Staff) and Project Manager for Rehab	'Feasibility study to inform the design of a Randomised Control Trial to assess the effectiveness of Functional	National Institute for Health Research, Research for Patient Benefit	£247,127.00	Bid unsuccessful Will re-submit 2019/20

³ Research Capability Funding - this is provided by the NIHR to help research-active NHS organisations to act flexibly and strategically to maintain research capacity and capability, support the appointment, development and retention of key staff and undertake or support people and patient based research.

Bid Title	Lead Researcher	Funding Body	Budget	Bid Outcome
	Electrical Stimulation for management of Constipation associated with Multiple Sclerosis (FESCaMS)			
Research and Innovation Team	Research Support Officer post to support the portfolio research manager	* Clinical Research Network: West Midlands Annual Strategic Funding	£42,204	Not successful
Snacktivity	Amanda Dailey Loughborough University	NIHR Programme Development Grant	£2.2 million	Successful

Funding applications made in 2018/19

Bid Title	Lead Researcher	Funding Body	Budget	Bid Outcome
Adapting a domestic abuse identification and referral intervention for use in an English health visiting service: a mixed-method feasibility study	Dr Caroline Bradbury-Jones University of Birmingham	NIHR RfPB	£150,000	At Stage 2
A group-based, game-based intervention for post-stroke aphasia: An integrated package to improve language, mood and quality of life.	Christina Romani (Aston University) and Louise Lander (BCHC)	Stroke Association	£356,820	Unsuccessful Plans for re-submission
Down's syndrome and dementia – Investigation of genes for Alzheimer's disease in adults with Down's syndrome	Professor Vee Prasher LD	Alzheimer's Society: Senior Fellowships	£150,000	Unsuccessful
Developing an intervention to reduce sedentary behaviour in non-ambulant young people with long-term disabilities.	Marilyn (Poole) Bradbury	HEE/ NIHR ICA Programme Clinical Doctoral Research Fellowship	£250,000	Successful
Research Nurse/Therapist P/T	Research and Innovation Team	* Clinical Research	£92,530	Successful

Bid Title	Lead Researcher	Funding Body	Budget	Bid Outcome
1 year only Research Nurse/Therapist F/T 1 year only		Network: West Midlands Annual Strategic Funding		
Clinical Trial Scholar Award	Dr Joanne Garstang C&F	* Clinical Research Network: West Midlands	£24,720	Successful

New Studies Opened during 2018/19

In total 27 new research studies opened, of which 16 are NIHR Portfolio studies. All studies are listed below.

Studies adopted onto the National Institute for Health Research Portfolio	
Study Title	Division and Local study lead
ORION - Abnormal genes and proteins in oral inflammatory diseases	Dental Services Dr Ana Pavedo, Consultant in Oral Medicine
Determining adolescent/parent priorities in hypodontia	Dental Services Professor Balvinder Khambay, Consultant in Orthodontics
EB DEBRA Project - Characterisation of the skin microbiome and investigation of neutrophil function in Epidermolysis Bullosa patients.	Dental Services Professor Iain Chapple, Consultant in Restorative Dentistry
CYPACP - Evaluating Advance Care Plans. Listening to families and professionals	Children and Families Services Hayley Creswell, Deputy Lead Nurse Children's Palliative Care
FEEDS - Focus on early eating, drinking and swallowing	Children and Families Services and Adult Specialist Rehabilitation Sue Meredith, Clinical Lead Paediatric Dietetics and Enteral Feeding and Kay Jones, Clinical Expert Speech and Language Therapist
ADAPT Survey - HCP Feedback on Smart Wheelchairs and a Training Simulator	Adult Specialist Rehabilitation Services Dr Clive Thursfield, Research Director
ADAPT Survey - HCP Training in Assistive Technology	Multiple Divisions R&I Department and relevant service leads
iRISC - Identification of children at risk of severe challenging behaviour.	Children and Families Services Dr Neal McCathie, Community Paediatrician / Clinical Director
Improving utilisation of pulmonary rehabilitation v1	Corporate Services No local lead, R&I Department
I-Play Project - Increasing physical activity in children with long term physical disabilities using a personalised gaming system: A Feasibility Study	Children and Families Services Marilyn Poole, Paediatric Physiotherapist
PFP - Parkinson's Families Project	Adult Community Services Rose Crouch and Debbie Liberato, Parkinson's Disease Nurse Specialist
Patients' preference in anaesthetic type for tooth extractions	Dental Services Bosun Hong, NIHR Academic Clinical Fellow in Oral Surgery
CHARP - Pre-appointment written materials in children's therapy services	Children and Families Services Ali Beard, Professional Clinical Lead, Children's Speech and Language Therapy

Understanding vaccination uptake amongst Polish & Romanian migrants-v1	Children and Families Services Patricia Rushton, Clinical Team Leader, Visiting
THRIVE into Work - West Midlands Combined Authority Health-led Trial	Corporate Services No local lead, R&I Department
Work Proms - Work outcome measures in arthritis and musculoskeletal conditions	Adult Specialist Rehabilitation Services Jonathan Price, Advanced Physiotherapist

Studies not eligible for adoption onto the National Institute for Health Research Portfolio	
Study Title	Division and Local study lead
A qualitative study exploring school nurse's experiences of safeguarding adolescents (10-19 years) in their role in practice.	Children and Families Services Geraldine Goodall, Acting Operational Manager/ Acting Head of Service 0-19 Universal Services
Child Feeding Practices - A comparison of child-feeding practices among mothers attending a weight management service and mothers in the community	Adult Specialist Rehabilitation Services Kim Malcomson, Dietitian and Primary Care Team Leader
Discussions about female genital mutilation/cutting FGM/C - A survey of experiences and views of health professionals in Birmingham.	Children and Families Services Elaine Meredith, Transformation Lead, Bham Forward Steps
Does TFM add benefit to loading exercises for Achilles Tendinopathy?	Adult Specialist Rehabilitation Services Emrah Altinpulluk, Physiotherapist
Oro-facial MoCa - The use of oro-facial motion capture in medicine and dentistry	Dental Services Professor Balvinder Khambay, Consultant in Orthodontics
Patient Perceptions of Pressure ulcer risk in Community Settings	Adult Community Services Louise Morris, Prevention of Harms Practitioner Pressure Ulcers
South Asian women's experiences of medically unexplained symptoms	Adult Specialist Rehabilitation Services Dr Adam Cleary, Consultant Clinical Psychologist
Survey in Oral Health Care in Stroke	Adult Specialist Rehabilitation Services Ann Anderson, Stroke Services
The Inclusion of diverse cultural groups in Speech and Language Therapy services for preschool children.	Children and Families Services Ali Beard, Professional Clinical Lead, Children's Speech and Language Therapy
Tools to Measure Organisational Culture In English NHS Hospitals.	Corporate Services No local lead, R&I Department
Vocabulary Intervention for Late Talkers	Children and Families Services Ali Beard, Professional Clinical Lead, Children's Speech and Language Therapy

2017/18 Activities against the BCHC Research Strategy and Innovation Strategy Objectives

1. Promote and champion research within the BCHC staff group

The R&I team have worked to promote research and encourage staff members to engage with research.

Development of a Clinical Research Pathway:

The team continue to support staff to apply for Health Education England/National Institute for Health Research sponsored training programmes

- i) Clinical Academic Internship Partnership (CAIP) and
- ii) PhD Bridging programme.
- iii) NIHR Fellowships
- iv) Clinical Scholar Award (CRN WM)

We are committed to this bold strategic step to develop clinical and non-clinical staff as researchers and clinical academics housed not in academic institutions but within the NHS. This development marks the foundation of internal research growth.



Staff Training:

Free research training courses such as i) Good Clinical Practice, ii) how to take informed consent and iii) principal investigator oversight training was promoted via the intranet. A number of new clinical groups have engaged with research this year and have engaged in this training.

Multidisciplinary Research Support:

Backfill and research support was provided to the MSK service for a member of staff to conduct two clinical trials, as a result the level of research awareness and participation has increased and also generated academic collaborations and the development of a new specialist group across the region. This model of working is an aspiration to be replicated in other services.

Research Nurse:

Following the success of strategic funding from the Clinical Research Network, BCHC was successful in gaining a research nurse in collaboration with the Black Country Partnership and Dudley and Walsall Mental Health Foundation Trust. The nurse worked across these Trusts with a particular emphasis on dementia and neurodegenerative studies. This initiative has resulted in an increased number of patients recruited into studies and close relationships with neighbouring Trusts.

Committee Representation:

The R&I team provides a research focus at the enhanced dementia training and a representative attends the quarterly dementia steering committee. A representative also sits on the new Education, Training and Research Committee.



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Research Support from Birmingham City University

Dr Sarahjane Jones, Senior Research Fellow at Birmingham City University, has been contracted by the R&I team to provide research support, mentoring and training for BCHC staff at the earlier stages of their research journey. She has been supporting many staff members over the past few years in areas of designing research, grant writing, research methodology and publications. In 2018-19, she continued to support staff members on various initiatives that are listed in the table below.

Area of Support	Activities	Deliverables	Planned Deliverables within 12 Months
Evaluation of Patient Safety Ambassador (PSA) Programme	<ul style="list-style-type: none">- Two workshops were organised and delivered with some of the previous PSA members- A plan of action was drawn up for a methodical evaluation of the impact of the programme on the organisation and the patients.- A survey was designed and draft protocol prepared.	<ul style="list-style-type: none">- Attendance at the RCN's research conference (paid for by BCU) for networking and skill development for a BCHC member and a BCU member of the collaborative team.- Unfortunately due to lack of engagement from the BCHC staff members involved in the PSA programme, this particular initiative had to be dropped without any measurable outcome details if you need them are, 1 member went on long term sick, another member changed job role, a third member struggled to make the commitment leaving only Carole Owen participating.	

Area of Support	Activities	Deliverables	Planned Deliverables within 12 Months
Carole Owen – Rehab Assistant	<ul style="list-style-type: none"> - Submission of abstract to Celebrating Multidisciplinary Research in the NHS 2018 to include abstract and poster (0.5days) - Training on delivering a poster presentation and attendance at Celebrating Multidisciplinary Research in the NHS in support of Carole (1day) - Submission of application to MidTECH Award, production of the talking head (plus 2 other BCU people in the development of this) and other associated PR, meeting with innovator and attendance at awards (5 days) - Efforts to identify an individual who could produce a design specification for the Step Right Buddy - Continued support to develop research skills including submission to the annual C-SCHaRR conference, working with Carole to submit an abstract, write a presentation and attend the conference - Liaised with the RCN regarding being involved in the HCA network - 3 days for the above 3 points 	<ul style="list-style-type: none"> - Completion of a clinical trial to assess feasibility and acceptability of the Step Right Buddy - Short listed for the MidTECH award and secured £1,000 development grant - preparing a paper for submission - a grant submission before the end of 2019 	<ul style="list-style-type: none"> - high quality peer review publication - Potential Grant submission
Shawab Mir - Physiotherapist	<ul style="list-style-type: none"> - Continued support to complete the systematic review - Statistician support for meta-analysis in the 	<ul style="list-style-type: none"> - Submission for £30k of grant funding from the Chartered Society of Physiotherapy (outcome unsuccessful but helpful 	<ul style="list-style-type: none"> - high quality peer review publication - Submission to bridging

Area of Support	Activities	Deliverables	Planned Deliverables within 12 Months
	absence of the statistician at UoB (5 days)	feedback) - Submission for systematic review due in September	programme
Maria Cass - Physiotherapis	<ul style="list-style-type: none"> - PROMs Service Evaluation over the Autumn to explore clinician’s use of the MSK pain PROMs and its cultural inclusivity (3 days) - Design and implementation of a PPIE working group over the Autumn (2 days) - Design of a study proposal and application to the Physiotherapy Research Foundation in Spring (3 days) - 	<ul style="list-style-type: none"> - Submitted application to the Chartered Society of Physiotherapy for £30k (outcome unsuccessful but helpful feedback) 	
Kate Codd – Health Visitor	<ul style="list-style-type: none"> - Meeting and email communication to discuss RCN bursary opportunity and other options (0.5 days) 	<ul style="list-style-type: none"> - Need to agree to develop a research development plan 	

2. Make the BCHC research offer more competitive

Growth of Research and Innovation

Collaborations generated with academic organisations are continuing and new agreements are being forged with for example Surrey and Borders NHS Trust for innovation projects and with Loughborough (Snacktivity) and Swansea Universities (Trauma Ai) for two new NIHR bids that will require close collaborative working for the next 4 years.

Commercial Clinical Research Organisations (CRO)

Discussions continue with commercial CROs to explore the possibility of them setting up a clinical trial unit within BCHC.

3. Reduce financial risks – increase financial stability

Bids and Training Opportunities

Bid success and training opportunities such as NIHR Fellowships, Clinical Trial Scholar posts or Pre-Doctoral Research Fellowship all generate funds that cover the costs of the researcher. Financial stability is key to the growth and development of Research and Innovation within BCHC.

Introduction of iDox Grantfinder



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A new database called idox Grantfinder has been introduced this tool will provide an opportunity for non-portfolio researchers to search for funds which could convert their research to portfolio. Grantfinder can also be used for searching for conference fees and other awards. A small group of research leads and volunteer staff have also received Grantfinder training.

We have established an honorary contract with a retired academic from the University of Birmingham who will assist with the set up and running of Grantfinder.

Stability of the R&I Team

Extensive work around bid submission has taken place however success was not realised until 2018/19 and therefore the funds will not be released until 2019/20. The Trust agreed to provide a one off cost pressure payment in order to maintain stability. The new R&I strategy intends to address future stability of the team.

4. Make BCHC fit for purpose to sustain and attract high quality research

Development of a Community Trust Alliance:

BCHC is leading on a community alliance initiative across England. Key actions include developing methods to share research projects, sharing best practice and generating new research studies specific to a Community setting. Work is on-going to identify a suitable platform for national conversations and the Terms of Reference have been drawn up.

Patient Research Ambassador (PRA):

There is one PRA representative with the R&I team, this role will lead on supporting the promotion of research to other patients and carers and contribute to the design of new research. Plans are in place to increase the number of PRA's in the near future.

New areas of research – there is limited research leadership in the divisions and corporate services and capacity to engage with research is a challenge however significant efforts have been made to engage several services. Trust wide, corporate or cross divisional studies have aided the recruitment target particularly with staff surveys.

Awards

BCHC have experienced a significant amount of success with research and innovation.

- CRN Highly Commended – Best Overall Performance Award 2017.
- CRN BCHC contribution to research - in the area of older adults 2017
- CRN Dr Thomas Dietrich (Dental) – Researcher of the Year 2017
- Dental School was ranked first in the country for dentistry research in the Research Excellence Framework 2017
- VIP finalist - Mr Hamid Zolfagharinia) for his contribution to the Trusts “Quality” standard 2017
- CRN Highly Commended – Best Overall Performance Award 2018.
- CRN New Research Category – MSK Service Runners up 2018
- CRN Clinical Trials Scholar programme – Dr Joanne Garstang C&F 2018
- R&I team - VIP runners up in the ‘Inclusive’ category 2018



Innovation

The Innovation team continued to deliver against the following strategic objectives set out for 2018-19. A new member of bank staff joined the team in April 2018, to fulfil the role of the Innovation Facilitator that had not been effectively fulfilled as of October 2017 when the previous staff member had vacated the role. See below for a detailed report on the activities of the Innovation team in 2018-19.

1. Establish a central innovation function for the Trust:

R&I Committee

The R&I team drafted the Terms of Reference for a new committee that will oversee all research and innovation activities in the Trust.

The proposed scope for the committee is as follows, subject to approval:

- To monitor progress and report against strategic objectives under the Research and Innovation strategy at BCHC.
- To provide Leadership and Direction to establish and maintain BCHC as 'research significant' organisation in line with the clinical priorities and patient benefits and requirements.
- To ensure the assurance framework for the imminent set of Research Standards under CQC's Well-led category is monitored and delivered.
- To work closely with the Digital Technology Steering Group in accelerating the use of digital technology in line with the priority for BCHC 'Fit for 2022'
- To ensure alignment with other relevant BCHC and STP transformational and developmental initiatives.
- To lead on external partnerships with academic and private sector partners in the areas of collaborative research and innovation with BCHC.

Virtual Innovation Forum (VIF)

The VIF continued to receive submissions from the members of staff within the trust for innovation ideas or challenges requiring innovative approach. Here are some of the submissions:

- **Community Weighing Project:** Challenge of weighing patients in the community. The challenge was discussed with three manufacturers of medical scales and it has been agreed to seek external funding for development of a fit for purpose solution.
- **Night Lighting for Nurses:** The reported challenge was low level lights in wards at nights and risk of errors made on patient notes lighting level. 2 clip-on spotlights were purchased for the team to attach to patient notes clipboard for use in dark hours.
- **Recycling equipment in Community:** Issue of unused prescribed equipment and medication creating clutter in patients' homes. Contact was made with Local Authority who run the equipment contract and they reassured that removal of equipment after use will be added to the tender specification at the time of renewing the contract with the provider (mediquip)
- **Eye Drop dispenser:** Need for innovative eye drop dispensers that could potentially alleviate the need for a district nurse to attend to put eye drops into the patients' eye. Various items were sourced and presented by the innovation team to the requestor. This

was then transformed into a Listening into Action project where demo packs of these devices are prepared to offer to patients to choose the suitable one for their care.

- **Falls reduction through lighting:** A challenge was brought to the attention of the Innovation team by the Estates department about issue of insufficient lighting in the intermediate care centres, potentially leading to falls amongst elderly patients. Bulbs with inbuilt motion-sensor were identified and purchase for a trial on site. These bulbs will be tested to see if they will provide sufficient lighting upon patients' exiting the bed.

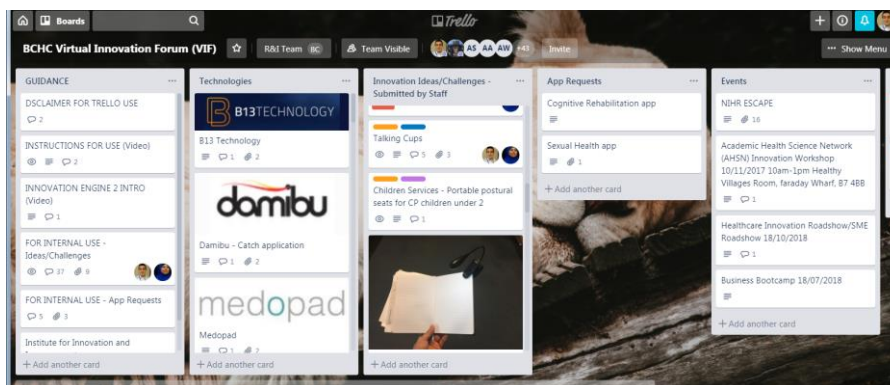


Table 1 Virtual Innovation Forum (VIF) Trello Board

Visit to BSMHT Innovation Team

A visit was arranged to the Innovation Team at Birmingham and Solihull Mental Health Trust to discuss the structure of their team and the methodology in approaching Innovation within the Trust. Key lesson learnt was the offer of research skills as part of the Innovation service offering, in technology market surveys, impact assessment, critical data analysis etc. The new R&I strategy in BCHC will incorporate this new offer under a new service called Research and Innovation into Quality Improvement (RIQI). We also took away from the visit the structure and documentation for the innovation pathway that can be made fit for purpose and put to use at BCHC.

APP Questionnaire:

Innovation team has now developed an App questionnaire that needs to be completed for BCHC staff members who need an app to improve their service. The questionnaire is implemented as a web form on the intranet and the link can be found below:

<http://mobappdevquestionnaire.bhamcommunity.nhs.uk/>

This will enable us to have a central awareness of the needs for app development/utilisation across all services. We are then able to survey the market to see if any existing solutions will meet the expressed needs and if not, approach developers with a more refined description of the user specifications for an app.

2. Position BCHC to take advantage of local, regional and national initiatives



100K Genomes Project

R&I Led BCHC in 2017-18 on joining the 100,000 Genome project as the first Community Healthcare NHS Trust. The project objective was to offer whole genome sequencing to our patients with rare diseases in

order to help improve care through better understanding of the genetic contributors.

The project's recruitment ended in September and the final number of recruited subjects from BCHC was 40, 28 of which will go against our annual research recruitment target subject to approval.

Test Bed Fast Follower Site – TIHM for Dementia Pilot Project

TIHM (Technology Integrated Healthcare Management) Test Bed lead partners, Surrey and Borders partnership NHS Foundation Trust (SABP), have invited us to be a fast follower site with 25 patients for their TIHM project. In this project we will be using environmental and wearable (including physiological) sensors and Artificial Intelligence enabled analysis to enable patients with dementia/cognitive impairment to live more independently. R&I team paid for the deployment costs of the project and we are set to start recruiting for the pilot as of 1st September 2019. InnovateUK and NHS England (NHSE) have been very excited by the news of us joining the project as a "Fast Follower" site and agreed to provide additional funds to the pilot so that we can recruit more patients during the project (25 as opposed to original target of 10).

NHSE have also asked SABP to write a piece in the NHS Provider bulletin for NHSI about this collaboration and we have been asked for input into that piece. SABP colleagues have also asked us to lead on arranging some visits from the NHSE and DH team to see us when we are up and running.

Adult Social Care Commissioning - Assistive Technology Working Group

The R&I team have been invited to a number of meetings led by the social care commissioning group at the council to participate in a newly formed Assistive Technology (AT) working group. The team at the council are formulating a business case for introduction of remote monitoring and self-care enabling technologies in the homes of 6,000 citizens and are keen to have health input from BCHC. As a result, the BCHC Early Intervention team were offered to start utilising the JustChecking Technology for the patients they see, who are discharged early or are kept at home under their care. The technology is commissioned by the local authority and monitors patient's activity for a 2-week period and a report is then provided to the carers and clinicians to reflect how active and mobile the patient is.

STEAMLab Hackathon

An organisation based at Birmingham City University who approached our Pulmonary Rehab team to identify challenges that could be addressed in Health hackathon events. A hackathon is a forum that brings people together to discuss challenge(s) that could be resolved with the use of innovative technology. The following 3 challenges were shortlisted for the event:

- Patients don't attend their breathing rehabilitation classes resulting in them not learning the techniques to help them manage their condition
- High number of patients missed clinic appointments resulting in them missing out on help to manage their condition
- Patients don't do their chest-clearance techniques correctly resulting in them being less effective at managing their condition.

This hackathon was held in April. However, the attending clinician felt that the solutions discussed were necessarily fit or of true innovative value for the respiratory medicine service. Nevertheless,

the process helped with articulating and discussing the real challenges in community respiratory rehabilitation.

3. Increase income for a sustainable innovation function and leadership

Test Bed Project

An application was submitted for a 7-day “Advanced Clinical Advice Centre (ACAC)” utilising home-based monitoring technologies and remote video facilities to enable a holistic approach to well-being of patients with multiple long-term conditions, through virtual clinics held at a Multi-Disciplinary Team Hub at St Stephens centre. Unfortunately the application was not successful. The team continue to search for the right funding regime that would be a fit for this proposed intervention.

Innovation Engine 2 project

This was an ERDF (European Regional Development Fund) project led by Innovation Birmingham, delivered by BCHC in partnership with Birmingham City University, University Hospitals Birmingham, Birmingham University and Transport for West Midlands. The remit of the project was to deliver Business Assists to over 180 Small to Medium Enterprises (SME) to help them grow in the areas of health, transport and sustainability.



Table 2 Delivery team of the Innovation Engine 2 Project

The project came to an end in Dec 2018 and has now delivered 31 Business assists against the initial target of 24 companies to be assisted. This is an excellent achievement and has led to a lot of collaborations with small to medium companies, to the benefit of BCHC and its patients.

The project generated an overall income of £184,701 for BCHC over a 3-year period.

CM2000 Joint Funding Application for Fall Prevention:

The R&I collaborated with this company and the Council’s Digital Birmingham team on a funding application but the Digital Birmingham team decided to pull out close to the deadline due to lack of senior management availability for approval. The proposal focused on the use of wearable technologies for remote monitoring of patients to predict falls.

Healthy Ageing Workshop Birmingham - Joint Surrey and West Midlands Consortium

A workshop was organised by the innovation team at BCHC in November 2018, with attendance from Surrey NHS Trusts and representation from West Midlands stakeholders such as STPs, NHS Trusts and voluntary sector organisations, to discuss the potential for a joint bid, possibly for one of the “Demonstrator” projects (£75M for 3-9 initiatives) under the Healthy Ageing call, part of the Industrial Strategy Challenge Fund. The call has been delayed until later in 2019.

4. Promote and champion innovation within the BCHC staff group



BabyCheck App Launch at Parliament

Hosted by Diana Johnson MP, this app was officially launched at the Houses of Parliament on 12th June. The launch event that was organised by Lullaby Trust was also attended by celebrity Dr Elle and two other Birmingham MP's, Steve McCabe and Ian Austin.

Patient Centred Solutions (PCS) Event – Children & Families

The second one of PCS event series was held on 21st June 2018 at iCentrum. At this event 17 companies presented and the staff had a chance to learn about the showcased their technologies. The theme of this event was technologies that would be applicable to the services provided in our children and families division. The link to the full video of the event is available at <https://youtu.be/L6-osXYx-UU>. Here is also the Twitter hashtag for the event #pcs_2018.



Step Right Buddy

This project was successful in securing the Innovation Award of the West Midlands Academic Health Science Network (WMAHSN). Designed by Carole Owen, Rehabilitation Assistant, the device is an innovative solution in form of an accessory added to the walking frames of patients, in order to reduce the risk of a backward fall by way of creating a visual cue and a physical barrier to prevent users from walking too far into the frame.

The award of £1,000 will be utilised in improving the proto-type to a more commercially acceptable version.

5. Ensure innovation serves patients, staff members and the Trust

BrainInHand

The app will help patients with acquired brain injuries cope with daily tasks through pre-determined coping strategies and also record their feelings through the day, for review with their clinicians at an appointment.

The innovation team assisted the service at Moor Green, to acquire and deploy the solution for 5 patients on a trial basis for one year.

QTUG Falls Detection Devices

2 QTUG devices were purchased, by the R&I team, from a company called Kinesis for use in the community to evaluate the feasibility of this well-established acute sector technology in a community setting. The device can quantitatively measure the risk of fall in patients by being attached to the patient's legs during a Timed-Up&Go (TUG) test. The devices also analyse the patient's gait and provide insight into potential issues with gait and ways to address them.

BrainInHand

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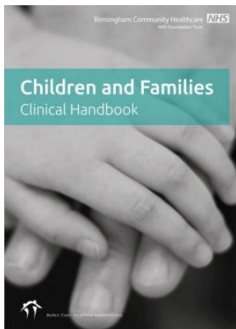
The innovation team assisted the service at Moor Green, to acquire and deploy the solution for 5 patients on a trial basis for one year.

SPEaC Happy App

This app collates feedback and mood ratings from staff in a ward/area/department, and provides real-time reporting of the mood and feedback from staff after moderation of the submissions. This can be used to provide intelligence and insight in a department or within a team, and help to promote the responsiveness of the organisation. The app will be piloted in 2 areas within the Trust.

Virtual Appointments Pilot

The C&F Rapid Response team requested the input of R&I team in piloting “Virtual Appointments” in dealing with winter pressures. This pilot intended to allow them to remotely assess the needs of a patient to ascertain whether a physical visit or an outpatient appointment is required. Innovation team liaised with Webex for data privacy assessment and prepared an ad-hoc set of user instructions for the clinicians on how to use Webex for virtual clinical appointments.



Clinical Handbook App for C&F

This app was scoped by the Children & Families (C&F) division and with the assistance of the Innovation team. The app provides the C&F colleagues with an easy to access and easy to navigate version of their clinical handbook. The development was then outsourced to a company called B13Technologies who successfully developed and deployed it on iPhones and Android devices. The roll-out on Trust Blackberry (BB) devices was delayed but successfully completed with delay.

Banking app for people with learning disabilities

The challenge of this app came from our LD team to assist their patients in looking after their money. The fact that they are unable to budget and fall into debt adds to the patients’ anxiety which essentially means they require further care from the team.

Via iDox, the innovation team found a source of potential funding for this initiative from Margaret Dobson Further Education Trust. BCHC has now submitted the application. The outcome will not be known until mid-July 2019.

Medopad App:

This company offered free use of their healthcare app to BCHC. It was claimed that the app would be suitable for self-care amongst patients with a range of long-term conditions. After offering the opportunity to clinicians in various forums, there is interest in follow from the Dietetics service. A meeting was arranged with the company and the clinician, Kimberley Malcolmson (Dietician) who wanted to use the app for free for 12 months to help patients on weight management programmes. However, this project has been stopped mainly due to the following 2 reasons:

- IG team identified concerns with the Privacy Policy of the company that will take control of data out of BCHC’s hand even though we are the customers and “data controllers”.
- The app did not meet all the needs of the Dietetics team and undesirable compromises had to be agreed upon, such as using the medication reminder tool instead of a proper goal-tracker tool



Research and Innovation into Quality Improvement (RIQI) Report – Reminiscing software

BCHC Charity were asked by the Dementia Steering Group (DSG) for support with purchasing a reminiscing software for dementia patients in the community and inpatient units. R&I team have been approached by the

Charity staff to provide advice and support on purchasing the right software. The R&I team compiled a RIQI (Research and Innovation into Quality Improvement) report to assist the DSG in their decision-making process.

Intellectual Property (IP) Policy Update

The policy has been updated to reflect the requirement for discussions with third party suppliers when collaborative arrangements are being put in place with BCHC where there is a potential for Intellectual Property arising. Teams such as procurement and business development will need to consider these as part of contractual arrangements with companies so that IP matters are covered during the course of collaborations. This will help us avoid ambiguities that resulted on IP ownership of solutions that will developed.

The table of sharing revenues with originators of IP has also been updated more in favour of the IP originators. Staff members shared their concerns with us on the slight unfairness of the sharing arrangements that discouraged staff members from wanting to develop IP during work. This has been updated in consultation with Midtech, our IP consultants and also other NHS Trusts.

Cumulative Net Income	Inventor	Clinical Division	Trust
First £50,000	70%	15%	15%
Next £100,000	55%	22.5%	22.5%
Next £100,000	40%	30%	30%
Over £250,000	30%	35%	35%

Table 3 Revenue Sharing Agreement Table for Income from Exploited IP

Reports from the Divisions

(Lists of Publications and Grants Awarded are available for each Division in a separate document)

Adults and Community Services

Summary provided by the R&I Team on behalf of this Division.

The adult community services continue to express an interest in research but lack capacity to engage with research more fully. The NIHR Health Service and Delivery Research funded study called Memorable was lead by the Medicine Management Research Lead in collaboration Aston University and involved interviewing healthcare professionals from BCHC and their carers. The aim of this research was to create a framework for a novel multi-disciplinary, multi-agency intervention, to improve medication management in older people on complex medication regimens. Memorable has come to an end this year however, the relationship between BCHC and Aston University continues to develop and two now potential studies have arisen which will go through the NIHR bidding process in 2019/20.

There are two new studies on the horizon for ACS:

- i) A randomised, double-blind placebo controlled trial of the effectiveness of the beta-blocker bisoprolol in preventing exacerbations of chronic obstructive pulmonary disease.
- ii) A group-based mobility training programme for older people with pre-frailty/frailty and mobility limitation. The aim is to estimate the clinical and cost effectiveness of the intervention.

Due to limited capacity, research support for the future will be developed over a number of years; this will include introducing staff to small research and training opportunities in the first instance. Within a few years the research culture will be embedded across the service and the R&I team will work closely with Liza Walsh and the service leads who will become new research leads from this year onwards to identify any possible opportunities within the constraints previously described.

Although capacity is challenged, the work that ACS engages with is always of great interest and value within the Trust.

Adult and Specialist Rehabilitation Services

Rehabilitation Services annual research summary 2018/19

Over this year the service has been involved in 9 non-commercial portfolio studies and 7 non-commercial non-portfolio studies which is a slight increase over last year. Three studies are in early phases and are not yet recruiting. BCHC is the sponsor for one of these studies, others being sponsored mainly by UoB.

Previous and on-going projects have resulted in three grant applications: one small grant application to Brain Research UK relating to navigation in people with brain injury was not successful; a large grant application for £250,000 to NIHR (FES for constipation) was not successful but is being revised and will be resubmitted and another large grant application for £400,000 has just been submitted to the Stroke Association (language game therapy) in collaboration with the universities of Aston, Sheffield and UCL (awaiting outcome).

Aside from grant applications, other impacts include publications and posters (appendix I). A project based at Moor Green looking at Acceptance after Brain injury won the DataBlitz prize at a recent international neurorehabilitation conference in Prague. Several presentations have been made at other national and international events this year, two based on a project in collaboration with University of Bradford relating to the economic impact of rehabilitation on carers (see appendix I). A project relating to carers perceptions of cognitive impairment is likely to result in changes to local clinical practice in brain injury and a project relating to symbol aids for children who are non-speaking (in collaboration with Manchester Metropolitan University) will hopefully result in a communication aids tool kit in the coming year. We continue to work on developing practice guidelines relating to deep vein thrombosis in wheelchair users and guidelines for bariatric wheelchair users.

Last year we began to develop a series of processes to support a research strategy, these included; a central database for presentations and publications for research which we have implemented, access to research grant information using Grantfinder and use of our clinical forum as a context for discussing research. We hope to continue with these initiatives; however, the service has recently undergone some major changes, combining with other areas of the Trust to create a new division. This will result in greater and more diverse opportunities for research which will require a new strategy which we hope to address over the coming year within the resources currently available.

Children and Families Services

Research Leads – Dr Joanna Garstang – Consultant Community Paediatrician, Marilyn Poole – Senior Paediatric Physiotherapist.

In October 2018, the research leads met with Dr Mariam El Hawli (divisional lead for clinical effectiveness) to discuss the divisional research strategy and promoting research within C&F. Our overall aim is that C&F will have at least 2 clinical academics who are Chief Investigators, with BCHC leading on multi-centre research projects; and several clinicians able to undertake Principal Investigator roles. In order to achieve this, we will need to promote research and train clinicians in research skills across the division; however clinical pressures limit the time available for such activities.

The research themes for the division are: vulnerable children with social needs, children with complex health needs, public health and a cross cutting theme of utilisation of technology in health care.

Progress made in relation to our 2017/18 divisional research strategy during 2018/19:

- *Develop research experience by recruiting to established research projects, particularly those on the NIHR portfolio*

The division have participated in numerous non-commercial NIHR portfolio studies. Three studies that opened in 2017/18 closed in 2018/19. Eleven remain open to recruitment of which six are portfolio and five non-portfolio. Staff from a range of disciplines, including paediatricians, physiotherapists, nursing staff and health visitors have acted as local collaborators or principal investigators for these studies. Backfill has been provided for participating staff for some studies. Recruitment to studies within children and families has increased year on year since 2016/17.

Feasibility of involvement in a further 3 studies is under investigation, and two expressions of interest have been made for studies under development.

- *Support research interested staff doing research as part of degrees, in applying for NIHR MRes programmes and in applications for higher research degrees.*

Speech Therapist Raman Kaur was awarded a clinical academic internship from October 18 to March 19, funded by HEE and organised by Birmingham Health Partners. This has led to increased research participation, training and awareness for all speech and language staff.

- *Start and grow our ability to act as co-applicants and eventually as principal investigators on peer reviewed research applications.*

Senior Physiotherapist Marilyn Poole was awarded an NIHR Clinical Doctoral Research Fellowship, to start in June 2019. The Fellowship will help build bridges with School of Sport and Exercise and the Medical and Dental School at the University of Birmingham, and with collaborators including Prof Chris Morris, from the Peninsula Cerebra Research Unit for Childhood Disability Research (PenCRU) and Dr. Niina Kolehmainen – Institute of Health and Society, Newcastle University.

M Poole was PI for the I-PLAY study - Increasing physical activity in children with long term physical disabilities using a personalised gaming system. This was a 2 site study, sponsored and led by BCHC, it recruited to target within time and is now in follow-up.

Consultant Paediatrician Dr Joanna Garstang was awarded a Clinical Research Network, Clinical Trials Scholarship; she is funded for 1 day per week for 2 years, based at the Institute of Applied

Health Research at the University of Birmingham. The aim of this award is to allow protected time and academic mentoring to enable submission of further successful NIHR research bids. Dr Garstang is working as a co-applicant on a proposal to develop a National Case Registry for Sudden Unexpected Child Death; the aim is to submit this to MRC early in 2020.

- *Encourage paediatric trainees to take part in research projects to help build capacity in community child health research*

Dr Garstang continues with this work. Dr Gabrielle Cropp and Dr Clare Morgans presented their audit of investigations into unexpected child death at the International Society for the Prevention and Study of Infant Death (ISPID) conference in Glasgow in Jun 2018.

- *Build on existing relationships with local universities, West Midlands Clinical Research Network (WMCNRN), surrounding acute trusts and potential commercial partners to maximise research capacity.*

The community paediatric team worked with the Cerebra centre at Birmingham University on the iRISK project, identifying children with developmental delay at risk of developing challenging behaviour. Over 300 children were recruited from clinics and special schools. Dr Neal MacCathie was Principal Investigator. Dr Garstang is working with the team developing the next stage of the project.

Dr Garstang completed her work on the Triennial Analysis of Serious Case Reviews with colleagues from the Universities of East Anglia and Warwick.

Other successes include:

- D Simkiss is chair of the ASD-UK database research steering group for the University of Newcastle
- D Simkiss is a member of the CLAHRC West Midlands Theme 1 (Maternity and Children) Steering Group
- D Simkiss is chair of the Trial Steering Group for EPPIC-ID a NIHR HTA trial – ‘Clinical and cost effectiveness of a parent mediated intervention to reduce challenging behaviour in pre-schoolers with moderate to severe learning disability: a RCT’
- D Simkiss is member of the editorial boards of Paediatrics and Child Health and the Journal of Tropical Pediatrics
- D Simkiss appointed as an Expert Advisor for the NICE Centre for Guidelines to give advice on the impact of new evidence on guidance, participate in committees as a topic specialist member and perform peer reviews of guidance
- J Garstang is a member of the national steering committee of the Care of Next Infant scheme at the Lullaby Trust contributing to on-going research into unexpected infant deaths
- Jo Garstang has given several presentations at national and international conferences concerning Sudden Unexpected Death in Infancy and Child Death Review, and has published several papers including invited editorials.
- J Garstang was invited as a key note speaker to the first Japanese conference on Child Death Review; and helped train over 50 Japanese paediatricians in conducting reviews.
- M Poole presented "Perspectives of children with neurodisabilities, their carers and therapists on use of walkers and modifying them to promote physical activity." She won the free paper presentation prize at the Association of Paediatric Chartered Physiotherapists annual conference in November and presented the study at Physiotherapy UK Conference in October 2018.

Dental Services

Research Report from Birmingham Dental Hospital 2018-2019

Organisation and Environment

Birmingham Dental School and Hospital **ranked number 1** from among 94 submissions in the Research Excellence Framework (REF) 2014 for 3*/4* research outputs: with 98.5% of manuscripts judged to be **world leading or internationally excellent**. We rank thirteenth in the 2019 QS World University League Tables in Dentistry, the number one Dental School nationwide outside of London. Most importantly we rank seventh in terms of citations per publication (an indicator of research influence and impact), and second in terms of employer reputation (an indicator of professional influence and impact), the **highest ranking UK school** in both these critical measures.

Today we continue to build upon our outstanding academic success in years to date, underpinned by a **sybiotic working relationship** between the University of Birmingham (UoB) and Birmingham Community Health Care Foundation Trust (BCHCFT). UoB-BCHCFT personnel share a bespoke laboratory and clinical facility, and benefit from dual contracts and shared responsibilities for research and development. Our collaboration enables us to achieve research excellence alongside student satisfaction scores of 84%, in addition to clinical service leadership in primary, secondary and tertiary care settings.

We occupy **state-of-the-art purpose-built** premises of 15,456m² including 914m² prime clinical spaces and 675m² prime research laboratories supported by a fully licensed biorepository (HTA license 12313), 2 ethically approved tissue banks and liquid nitrogen storage compound, with -80°C back-up. Substantial investments in these facilities (inspected and commended by the Human Tissue Authority in 2016) enable our investigators and students to harness cutting edge technology and equipment to accelerate scientific innovation for patient benefit. Indeed, we have invested almost £1M in research equipment infrastructure over the last 5 years.

The hospital serves a **large and diverse population** of ~5.5 million: with ~117,000 attendances annually. We also influence **national oral healthcare policy** through ongoing engagement with a range of organisations dedicated to clinical care, education, research, business and government. For example, we work with a consortium of UK Dental Schools and the Office for National Statistics to ensure robust national dental health surveys for adults and children. We maintain strong and fruitful partnerships with executive agencies such as Public Health England and NHS England, charities such as DEBRA and the Oral and Dental Research Trust, and pharmaceutical companies such as GlaxoSmithKline, Unilever and Philips (GlaxoSmithKline for more than 25 years, Unilever for more than 20 years, and Philips for more than 15 years). We are also co-authors of a commissioning standard from NHS England for oral health in diabetes, currently passing through government gateway, informed in part by our research.

Our **international relations** likewise comprise higher education institutions and networks such as Universitas 21, commercial organisations, educational groups such as the Association for Dental Education in Europe (ADEE), and professional groups such as the European Federation of Periodontology (EFP) and International Association for Dental Research (IADR). Highlights among our projects with collaborators worldwide include studies with partner teams in China, Brazil and the United States.

Over the last 5 years we have published **more than 450 manuscripts** including almost **300 with external partners** of whom **more than 220 are located overseas**. The strengths of the **vibrant and supportive research environment** we offer to early career investigators are borne out in 4 **Distinguished Young Investigator** awards from the International Association for Dental Research (IADR) in the last 12 years. In 2018 we also achieved a **Distinguished Scientist** award of the IADR. Thus, we already demonstrate a strong global footprint, which we aim to consolidate and grow in the months and years ahead through a number of strategic academic appointments and vibrant connections to other UoB Institutes, Colleges and

professional services: exploiting internal assets to respond swiftly and flexibly to emerging priorities in the research landscape.

Thematic Highlights

Collectively our investigators aim to develop excellence in discovery science, translational studies and clinical research to realise our vision of **Oral Health for a Better Life**. Many of our studies cut across disciplinary boundaries, broaching not only biology, medicine and surgery but also chemical and mechanical engineering, materials science, metallurgy, medical sociology, and applied health. The academic portfolio is characterised by 2 complementary research themes matured since REF 2014: with a clear pipeline from basic science at the laboratory bench to clinical service delivery at the bedside and beyond:

- **Clinical and Experimental Oral Sciences**
- **Oral Regeneration & Rehabilitation Sciences**

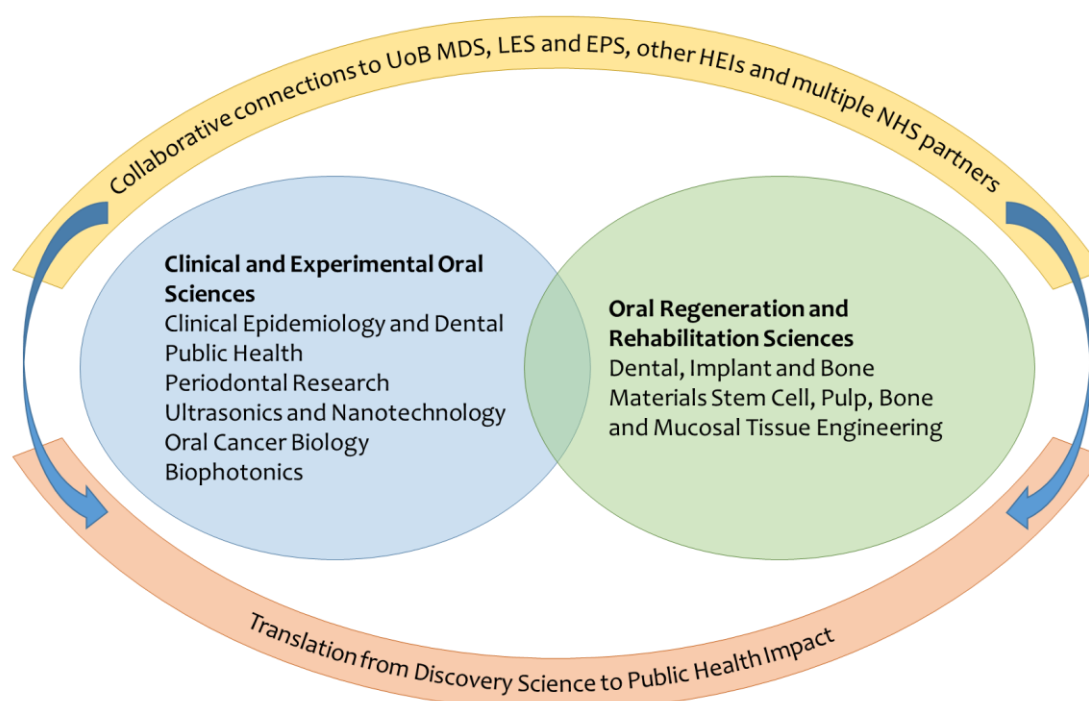


Figure 1: Research themes with productive and vibrant collaborations institutionally, regionally, nationally and internationally.

The 2 broad themes are underpinned by more specific research activities and collaborations, to collectively realise the **critical mass and synergy** required to understand complex mechanisms of human disease, to provide innovative diagnostic and therapeutic solutions, and to improve quality of life. We share expertise and facilities to mutual advantage in the co-supervision of doctoral studentships, joint publications and appointments (for example, **Khambay** is jointly appointed to the School of Dentistry and Dental Hospital, **Wiench** is jointly appointed to the School of Dentistry and the Institute of Cancer and Genomic Sciences, and **Kuehne** is jointly appointed to the School of Dentistry and the Institute of Microbiology & Infection). Below we highlight some of our recent activities and achievements.

Clinical and Experimental Oral Sciences

- *Clinical Epidemiology and Dental Public Health*
 - We have completed the NIHR RfPB-funded OPERA study investigating the impact of periodontal interventions on rheumatoid arthritis, and papers are published and in press.

- The periodontal research group (PRG) is exploring how periodontal inflammation may act as a trigger for the onset and/or progression of rheumatoid arthritis, funded by awards from the European Commission, ARUK and NIHR.
 - The PRG has recruited nearly 800 patients into a study considering the impact of periodontitis upon chronic kidney disease/failure and cardiovascular endpoints. We have demonstrated reduced survival rates in CKD patients with periodontal diseases and an interventional study funded by NIHR “INSPIRED” is at an advanced stage.
 - The PRG is also involved in a new study investigating risk-targeted early detection of diabetes in primary dental care settings and pharmacies.
 - The PRG has co-ordinated €multi-million international Initial Training Networks to explore the impact of periodontitis on systemic non-communicable diseases.
- *Periodontal Research*
 - The PRG has developed a new portfolio project to explore screening for systemic non-communicable diseases in primary care dental practice. The SUCCESS study has attracted charitable funding and influenced a Department of Health commissioning standard for periodontal care in people with diabetes, currently passing through government gateway.
 - **Sharma** has graduated from NIHR-funded doctoral study of the impact of periodontal therapy on patients with chronic kidney disease (INSPIRED).
 - The PRG has received repeated investment from Unilever to trial formulations of toothpastes, most recently seeking to minimise plaque accumulation.
 - Likewise the PRG has received repeated investment from GSK to trial manual toothbrushes, seeking to optimise plaque removal (SMILE).
 - The PRG has characterised the saliva and crevicular fluid proteome in health, gingivitis and mild and severe periodontitis, through a project designed to identify novel biomarkers. Our findings underpin 14 international patents with twin focus on diagnoses of periodontal disease and rheumatoid arthritis.
 - The PRG has unravelled the pathological basis of tooth loss in patients with Papillon-Lefevre syndrome.
 - Our spinout company Oral Health Innovations Ltd has extended risk prediction technology to over 600 dental practices, and over 130,000 patients have been assessed by over 800 dental surgeons using DEPPA and Previser software. Independent studies demonstrate an association with significant improvements in patient cognition, behavioural change and clinical oral health outcomes (Kings College London).
 - The PRG has also been instrumental in the development of the 2018 World Classification of Periodontal Diseases and Conditions published in June 2018 with our team as senior authors.
 - *Ultrasonics and Nanotechnology*
 - We are working with the School of Mathematics towards the development of innovative ultrasonic scalers, exploiting the production of cavitation bubbles at the water-tooth interface to remove plaque. This interdisciplinary research is funded by EPSRC.
 - We are also collaborating with investigators from the School of Chemistry to develop nanoparticle-containing biomaterials for dental use.
 - In 2018 we were awarded £1.1 million as part of a collaboration among researchers in Glasgow (engineering), Edinburgh (orthopaedics), Leeds (robotics), Southampton (solid mechanics) and Birmingham (cell regeneration). The total grant awarded by the EPSRC is worth £6 million to the consortium over 5 years.
 - *Oral Cancer Biology*
 - Through EPSRC investment, we are developing novel algorithms for intelligent microscopy to enhance histopathological tissue image interpretation.
 - We recently initiated a new programme of research with a focus on cancer epigenetics, working

with oncological specialists to advance mechanistic understandings of oral cancer and treatment.

- *Biophotonics*

- NIHR investment has enabled us to develop a novel prototype device for dental phototherapy and accelerated wound healing.
- We are pioneering photodisinfection in a project funded by the NIHR Surgical Reconstruction and Microbiology Research Centre (NIHR SRMRC).
- With financial support from the Ministry of Defence (MoD), we are developing novel therapies for wound-related injuries.

Oral Regeneration and Rehabilitation Sciences

- *Dental, Implant and Bone Materials*

- Ongoing studies of the abrasive properties of dentifrices are informing the development of novel toothpastes that minimise tooth wear whilst optimising cleaning and stain removal.
- NIHR-funded research undertaken via the national synchrotron science facility (the Diamond Light Source) has demonstrated that titanium dental implants can deteriorate, leading to an accumulation of debris in neighbouring tissues, with implications for implant survival.
- We are developing an optimised, spring-reinforced tissue-engineered bone-to-bone ligament replacement, with sufficient mechanical integrity to be implanted into a fully load-bearing animal model.
- Innovative research is underway to develop novel ceramic, resin-based and cement-based biomaterials with dental and orthopaedic applications. Crucially, we aim to optimise biocompatibility.
- Our research in metallurgy will develop and characterise novel metallic implant materials. Further studies will develop materials with antimicrobial properties to prevent infection and implant failure in dental and orthopaedic use.
- We have filed a patent with Orthos Ltd, to intellectually protect a novel accelerated-setting MTA-based material for use in root canal therapy.

- *Stem Cell, Pulp, Bone and Mucosal Tissue Engineering*

- NIHR investment continues to facilitate our development of a novel light-emitting device to minimise pain and accelerate tooth tissue repair following trauma associated with dental treatment.
- MoD monies support our investigations of the potential for low level light therapy to address dental trauma on the battlefield.
- We are investigating therapeutic opportunities for dental pulp stem cells to support and promote neuronal survival and regeneration, particularly utilising neurotropic effects to regenerate damaged optic nerve tissue.
- We continue to collaborate with biomedical engineers and metallurgists to develop encapsulated implantable devices to promote bone and tissue regeneration as well as bone and tissue repair.

Interdisciplinary Collaborations

Our interdisciplinary research is strengthened by active encouragement of **team science** to benefit patients, working together with counterparts affiliated to UoB Schools of Pharmacy, Nursing, Chemistry, Mathematics, Engineering, and Metallurgy and Materials, and NHS partners all over the country. For example, we are liaising with medicinal chemists and pharmacists to explore innovative pharmacological and pharmaceutical solutions for oral and craniofacial disorders and trauma. Our studies of tissue repair and regeneration benefit from proximity to the NIHR Surgical Reconstruction and Microbiology Research Centre (SRMRC) within the para-campus of Birmingham Health Partners. Meanwhile UoB Institutes of Translational Medicine (ITM), Microbiology and Infection (IMI), and Inflammation and Ageing (IIA) facilitate collaborations between our dental researchers and clinical specialists in rheumatology, renal medicine,

pulmonary medicine, and diabetes: enabling us to explore cardiovascular, bone and periodontal co-morbidities among well-characterised populations with chronic inflammatory diseases. The Institute of Cancer and Genomic Sciences (ICGS) hosts local collaborators with oncological expertise to advance our understanding of oral cancer.

We are also keen to build upon applied health partnerships to explore patient outcomes including quality of life for oral co-morbidities, combining experimental medicine studies in our joint dental-medical cohorts in chronic kidney disease, chronic obstructive pulmonary disease (COPD), rheumatoid arthritis and diabetes. For this purpose we are engaging with both health and social care providers and service users.

We are moreover pioneering the use of digital personalised biofeedback at the social-healthcare interface to drive **patient and public empowerment** in wellbeing, via our spinout company Oral Health Innovations Ltd (integration of PreViser, DEPPA and YDEPPA software into dental practice management software).

Our strong connections to **world-leading researchers throughout Europe** were recently strengthened by new appointments (Kebuschull and Kroeger) from the University of Bonn. Currently we are proactively liaising with all our European collaborators to protect relations post-Brexit: we look forward to ongoing engagement in international projects to be financed by the European Commission in the months and years ahead. We are also independently exploring opportunities to partner with investigators from Trinity College Dublin and the University of Amsterdam (ACTA).

Our interdisciplinary collaborations beyond national borders are further promoted by recent appointments of **international honorary visiting Professors** Ferracane (University of Oregon) and Nor (University of Michigan). We also regularly host visiting international researchers, and we recently contributed to a UoB delegation to Sao Paulo, to strengthen our **strategic partnerships** in Brazil.

Grants Awarded

The School of Dentistry holds almost **£8.1 million external research awards (£9.0 million full Economic Cost, fEC)** ongoing or notified in the year to April 2018. The monies were conferred by national organisations such as research councils (UKRI), the National Institute for Health Research (NIHR) and MoD: and by local, national and international charities and industry.

Grants Held or Awarded April 2018 to April 2019

SoDentistry Investigators (Lead in Bold)	Project Title	Awarded By	Start Date	Finish Date	Value
Deborah White	INTERVAL dental recalls trial (investigation of NICE technologies for enabling risk-variable-adjusted-length)	NIHR EVALUATION, TRIALS AND STUDIES COORDINATING CENTRE	01/08/2009	31/08/2018	£ 26,053
Thomas Dietrich , David Attrill, Damian Walmsley	A prospective, mono-centre clinical study to evaluate the peri-implant tissue outcome of CAD/CAM XiVE supra-structures in partly edentulous human subjects	DENTSPLY IMPLANTS MANUFACTURING GMBH	01/08/2011	31/12/2020	£ 82,000
Iain Chapple , Philip Lumley	Laboratory equipment grant	BIRMINGHAM COMMUNITY HEALTHCARE NHS TRUST	03/04/2012	31/03/2021	£ 931,767
William Palin	The use and development of a cosmetic dental varnish	TOOTHSHINE LTD	28/07/2012	28/02/2019	£ 36,430
Thomas Dietrich , Egon Musca	Preliminary evaluation of the efficacy and local tolerability of injectable diclofenac at 5, 12.5, 25 and 50 mg/mL, administered locally prior to surgery for the prevention of post-operative pain after third molar surgery	INSTITUT BIOCHIMIQUE	01/10/2012	31/12/2018	£ 72,250
Owen Addison , Melissa Grant, Joanna Batt	Cellular and molecular characterisation of the peri-implant soft tissue biological phenotype and its response to titanium implants: towards an objective molecular biotype definition	INTERNATIONAL TEAM FOR IMPLANTOLOGY	01/11/2013	31/08/2018	£ 100,683
Paul Cooper	Investigation of existing and novel toothpaste abrasives and toothbrush materials and designs, either alone or in combination, using in-vitro models	GLAXOSMITHKLINE	01/01/2014	31/12/2019	£ 616,629
Iain Chapple , Melissa Grant	Near patient diagnostic testing for periodontal disease presence and therapeutic outcomes using biosensor technology	PHILIPS ELECTRONICS	01/03/2015	31/12/2019	£ 312,151
Praveen Sharma , Iain Chapple, Thomas Dietrich	Effect of intensive periodontal therapy on systemic inflammatory markers in patients with chronic kidney disease	ORAL & DENTAL RESEARCH TRUST	13/03/2015	31/12/2020	£ 5,900
Praveen Sharma , Iain Chapple, Thomas Dietrich, Natalie Ives	Impact of successful periodontal intervention on renal and vascular systems in patients with chronic kidney disease	NIHR TRAINEES COORDINATING CENTRE	01/04/2015	31/03/2018	£ 353,702
Gabriel Landini	Novel context-based segmentation algorithms for intelligent microscopy	ENGINEERING & PHYSICAL SCIENCE RESEARCH COUNCIL	01/08/2015	31/01/2019	£ 497,291
Zehra Yonel , Iain Chapple, Thomas Dietrich	Screening for underlying chronic conditions in dental settings	ORAL & DENTAL RESEARCH TRUST	01/09/2015	31/03/2019	£ 6,368
Michael Milward , Paul Cooper, William Palin	Use of low level light for oral health	PHILIPS RESEARCH LABORATORIES	01/09/2015	28/02/2019	£ 23,167

William Palin	SRMRC 2: antibacterial solutions	NIHR	01/08/2016	31/07/2019	£ 37,153
Iain Chapple	Dental caries risk assessment	ORAL HEALTH INNOVATIONS LTD	01/09/2016	31/08/2019	£ 37,000
Rui Albuquerque	Smoking cessation	EUROPEAN COMMISSION	07/11/2016	06/09/2018	£ 17,890
Gabriel Landini, Richard Shelton	Tackling human dental caries by multi-modal correlative microscopy and multi-physics modelling	ENGINEERING & PHYSICAL SCIENCE RESEARCH COUNCIL	01/01/2017	31/12/2020	£ 539,092
Thomas Dietrich, Patricia Gorecki	Analgesic efficacy of oral dexketoprofen trometamol/tramadol hydrochloride versus tramadol hydrochloride/paracetamol: a randomised, double-blind, placebo and active controlled, parallel group study	MENARINI RICERCHE	08/02/2017	07/01/2020	£ 224,203
Melissa Grant, Isabel Lopez-Oliva	Correlation between the subgingival microbiome and host response in patients with rheumatoid arthritis and periodontitis, and effect of periodontal treatment	ORAL & DENTAL RESEARCH TRUST	01/04/2017	31/03/2018	£ 6,496
Phillip Tomson	Exploiting bioactive molecules in the dentine matrix for the treatment of apical periodontitis	BRITISH ENDODONTIC SOCIETY	01/04/2017	31/03/2020	£ 19,850
William Palin	Light transmission and polymerization characteristics of Filtek One Bulk Fill Restorative	3M DEUTSCHLAND GMBH	01/04/2017	30/06/2019	£ 17,221
Richard Shelton, Rui Albuquerque, Gabriel Landini, Paul Cooper	Molecular and cellular characterisation of oral lichen planus	ROYAL COLLEGE OF SURGEONS	01/04/2017	30/09/2018	£ 8,077
Katarzyna Gurzawska	Plant derived pectins nanocoating to modulate neutrophils inflammatory response on Porphyromonas gingivalis	ORAL & DENTAL RESEARCH TRUST	01/04/2017	31/03/2018	£ 6,200
Josefine Hirschfeld	The role of local and systemic free immunoglobulin light chains (FLCs) in the onset and progression of periodontal disease	ORAL & DENTAL RESEARCH TRUST	01/04/2017	31/10/2018	£ 6,410
Melissa Grant, Iain Chapple	Subgingival plaque sequencing project	COLGATE-PALMOLIVE	11/04/2017	10/04/2018	£ 13,642
Sarah Kuehne, Paul Cooper, Michael Milward	Characterisation of the potential role of second messengers in the virulence of dental pathogens associated with periodontitis	ROYAL COLLEGE OF SURGEONS	01/07/2017	28/02/2019	£ 7,550
Damian Walmsley	Maximising cavitation to clean dental implants	ENGINEERING & PHYSICAL SCIENCE RESEARCH COUNCIL	01/07/2017	30/06/2020	£ 628,265
Katarzyna Gurzawska	Bone substitute materials with osteogenic and anti-inflammatory properties	ROYAL COLLEGE OF SURGEONS	01/08/2017	31/12/2019	£ 9,900
Richard Shelton, Gabriel Landini, Paul Cooper	Development of injectable resorbable gels that set to fill tissue gaps and deliver cells to improve the treatment of cleft lips and palates avoiding a bone grafting operation for patients	GREAT ORMOND STREET HOSPITAL CHARITY	01/09/2017	31/05/2020	£ 147,021

Owen Addison	Process Design to Prevent Prosthetic Infections	ENGINEERING & PHYSICAL SCIENCE RESEARCH COUNCIL	01/09/2017	31/08/2020	£ 830,159
Michael Milward , Paul Cooper, Richard Shelton, Gabriel Landini	Characterisation of epithelial-mesenchymal trans-differentiation (EMT) in oral keratinocytes	GLAXOSMITHKLINE	01/10/2017	30/09/2021	£ 32,000
Damian Walmsley	H2020_IF_c2LEARN	EUROPEAN COMMISSION	23/10/2017	22/10/2019	£ 152,699
Iain Chapple , Josefine Hirschfeld, Sarah Kuehne, Melissa Grant	Characterisation of the skin microbiome and investigation of neutrophil function in Epidermolysis bullosa patients	DEBRA UK	01/01/2018	31/12/2020	£ 296,289
Michael Milward , Richard Shelton, Paul Cooper, William Palin, Sarah Kuehne	Development of novel phototherapy technology for decontamination and accelerated wound healing	DEFENCE SCIENCE AND TECHNOLOGY LABORATORY	01/01/2018	31/12/2021	£ 30,300
Ana Poveda Gallego	Characterisation for the first time the saliva proteome from patients with MMP, IBD and BD	ORAL & DENTAL RESEARCH TRUST GLAXOSMITHKLINE AWARD	01/01/2018	31/12/2019	£ 6,500
Josefine Hirschfeld	DGParo returnee scholarship: macrophage migration inhibitory factor	GERMAN SOCIETY OF PERIODONTOLOGY	01/02/2018	31/01/2019	£ 3,444
Phillip Tomson , JOSETTE Camilleri	High quality obturation simplified - is it possible? An investigation of the single cone technique used with hydraulic calcium silicate-based materials	EUROPEAN SOCIETY OF ENDODONTOLOGY	01/04/2018	31/03/2021	£ 15,625
Damien Walmsley	3-D Printed Dentures: development and assessment of cost-effective workflows to enhance clinical delivery	DUNHILL MEDICAL TRUST	01/06/2018	31/05/2021	£ 247,552
Sarah Kuehne	Uptake and bacterial survival within osteoblasts in the presence of particulate matter	SOCIETY FOR APPLIED MICROBIOLOGY	04/06/2018	03/08/2018	£ 2,000
JOSETTE Camilleri	Bonding to biodentine	SEPTODONT	20/06/2018	19/12/2018	£ 10,000
Gowsihan Poologasundarampillai	Research exchange on nanotheranostics with Nagoya Institute of Technology and Osaka Prefecture University	THE GREAT BRITAIN SASAKAWA FOUNDATION	16/07/2018	16/01/2020	£ 3,600
William Palin , Sarah Kuehne, Richard Shelton, Paul Cooper, Michael Milward	Portable phototherapy devices for maintaining tissue viability and accelerated wound repair	DEFENCE SCIENCE AND TECHNOLOGY LABORATORY	01/09/2018	30/06/2019	£ 99,651
Mohammed Hadis , William Palin	High energy curing of bulk-fill composites	IVOCLAR-VIVADENT	01/09/2018	31/10/2018	£ 9,380
William Palin , Paul Cooper, Michael Milward, Mohammed Hadis	Low level light therapy in the treatment of traumatic brain injury	MIDLAND NEUROSCIENCE TEACHING & RESEARCH FUND	03/09/2018	02/09/2019	£ 9,786

Iain Chapple , Michael Milward	Training and calibration exercise for oral care examiners in the assessment of gingivitis and plaque	GLAXOSMITHKLINE CONSUMER HEALTHCARE TRADING (UK) LTD	04/09/2018	31/05/2019	£ 73,863
William Palin , Mohammed Hadis	Polymerization stress of an experimental resin	3M COMPANY	01/10/2018	30/11/2018	£ 11,231
Phillip Tomson , Paul Cooper	Utilising bioactive molecules in dentine matrix for regeneration of the dental pulp following disease	ROYAL COLLEGE OF SURGEONS	01/10/2018	30/09/2019	£ 9,750
Iain Chapple , Zehra Yonel, Michael Milward	A randomized, single-blind, method development study in healthy subjects with adequate plaque to evaluate plaque removal with manual toothbrushes	GLAXOSMITHKLINE	01/11/2018	31/10/2021	£ 30,630
Damian Walmsley , Ben Scheven, Paul Cooper, Richard Shelton	Surgery enabled by ultrasonics	ENGINEERING & PHYSICAL SCIENCE RESEARCH COUNCIL	01/11/2018	31/10/2023	£ 894,830
Iain Chapple , Praveen Sharma	A study to assess plaque accumulation after four days use of prototype and marketing toothpastes	UNILEVER RESEARCH	06/12/2018	05/05/2019	£ 130,000
Melissa Grant , Iain Chapple	Viability of a novel biomarker for periodontal disease	SALV DX LLC	10/12/2018	09/12/2019	£ 17,278
Josefine Hirschfeld	Developing a three-dimensional research model of neutrophil-mediated tissue destruction during inflammation	THE ACADEMY OF MEDICAL SCIENCES	01/01/2019	31/12/2020	£ 29,700
Ajit Tanday	Targeted caries prevention in children attending for dental extractions	ORAL & DENTAL RESEARCH TRUST	01/01/2019	31/12/2024	£ 6,233
William Palin , Mohammed Hadis	Polymerization characteristics and dark cure properties of a novel dual-cure resin	3M DEUTSCHLAND GMBH	01/02/2019	30/04/2019	£ 15,842
Melissa Grant	Teeth marks	ARTS COUNCIL ENGLAND	17/04/2019	31/01/2020	£ 15,000
Phillip Tomson , Iain Chapple	Are there systemic effects associated with periradicular disease?	BRITISH ENDODONTIC SOCIETY	01/05/2019	30/04/2021	£ 11,125
Sarah Kuehne	Germination receptors of Clostridium difficile	WELLCOME TRUST	01/06/2019	29/02/2020	£ 6,193
Zehra Yonel , Iain Chapple	The role of the dental nurse in effecting positive behaviour change in primary medical care settings, using risk-driven personalised biofeedback to patients with diabetes and cardiovascular disease	ORAL & DENTAL RESEARCH TRUST COLGATE ROBIN DAVIES DCP RESEARCH AWARD	01/06/2019	31/05/2021	£ 4,430
Iain Chapple , Michael Milward, Zehra Yonel	Project smile: a randomized, single-blind, method development study in healthy subjects with adequate plaque to evaluate plaque removal with manual toothbrushes	GLAXOSMITHKLINE	22/09/2019	21/09/2020	£ 193,455
Paul Cooper , Michael Milward, Richard Shelton	Effects of nuclear hormone receptor stimulation in oral and skin epithelial cells	BBSRC-GLAXOSMITHKLINE CASE STUDENTSHIP	01/10/2019	30/09/2023	£ 108,148

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- Walter, C, **Chapple, ILC**, Ower, P, Tank, M, West, NX, Needleman, I, Hughes, FJ, Wadia, R, **Milward, MR**, Hodge, PJ, **Dietrich, T** & British Society of Periodontology 2019, 'Periodontal diagnosis in the context of the BSP implementation plan for the 2017 classification system of periodontal diseases and conditions: presentation of a pair of young siblings with periodontitis' *British Dental Journal*, vol. 226, no. 1, pp. 23-26.
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Personnel and Recruitment Activity

Academic and Research Personnel in April 2019

- Academic focus on teaching: 2
- Academic focus on teaching and research: 12
- Clinical focus on teaching: 11.5
- Clinical focus on teaching and research: 14.9
- Research: 5.6

- Total: 46

NIHR Academic Clinical Lecturers (ACLs)

Name			Department	Start date	End date
Dr	Katarzyna	Gurzawska	Oral Surgery	01 March 2015	28 February 2020
Dr	Sarah	Waring	Oral and Maxillofacial Pathology	30 March 2015	29 March 2020
Dr	Josefine	Hirschfeld	Restorative Dentistry	31 March 2016	31 March 2020

Locally Funded Clinical Lecturers (LFCLs)

Name			Department	Start date	End date
Mr	Praveen	Sharma	Restorative Dentistry	01 April 2018	02 October 2020
Dr	Upen	Patel	Restorative Dentistry	02 May 2016	01 May 2021

NIHR Academic Clinical Fellows (ACFs)

Surname	First name	Department	Start Date as SpR/Post CCST	Contract (years)	Finish date
Lavery	Dominic	Restorative (ACF)	30/03/2015	3	29/03/2020
Sidhu	Harlene	Oral Surgery (ACF)	31/03/2016	3	30/03/2019
Gohil	Tanika	Paediatric Dentistry (ACF)	03/10/2016	3	02/10/2019
Hong	Bosun	Oral Surgery (ACF)	06/09/2017	3	05/08/2020
Perks	Alexandra	Oral Medicine (ACF)	19/03/2018	3	18/03/2022
O'Reilly	Claire	Paediatric Dentistry (ACF)	19/03/2019	3	18/03/2022

Postgraduate Students

Name	Residence	Programme Title	Status
Abdelsalam Mohamad, Sherif	Overseas	PhD Dentistry FT (B100)	Ongoing
Abusurur, Ruba	Home	MSc by Res Dentistry PT (A400)	Ongoing
Adams, Lorna	Home	MPhil School of Den 2yr Lab PT	Thesis Awaited
Adedayo, Babatunde	Home	MSc by Res Dentistry FT (A400)	Ongoing
Alexander, James	Home	PhD Int St Innov Metal Proc FT	Ongoing
Al-Hadi, Noor	Home	MSc by Res Dentistry PT (A400)	Ongoing
Al-Hammadi, Zinab	Home	PhD School of Dent Non-Lab PT	Ongoing
Almaarik, Basmah	Overseas	PhD Dentistry FT (C500)	Soon to Start

Al-Maswary, Arwa	Overseas	PhD School of Dentistry Lab FT	Ongoing
Aly, Abdel	Home	PG VRS Dentistry FT A400	Ongoing
Ariffin, Farha	Overseas	PhD School of Dentistry Lab FT	Thesis Awaited
Badlishah Sham, Nurul Iman Binti	Overseas	PhD School of Dentistry Lab FT	Thesis Awaited
Baker, Amy	Home	MRes Cancer Sciences FT	Ongoing
Batal, Afif	Overseas	PhD Mechanical Engineering FT	Ongoing
Bombarda, Gabriela	Overseas	PG VRS Dentistry FT A400	Ongoing
Cordeiro Martins, Joana	Home	PG VRS Dentistry FT A400	Graduated October 2018
Cronshaw, Mark	Home	MSc by Res Dentistry PT (A400)	Ongoing
Da Cruz De Vasconcelos Ferreira, Isabel	Home	PG VRS Dentistry FT A400	Graduated October 2018
Dashtbozorg, Behnam	Home	PhD Int St Innov Metal Proc FT	Ongoing
Dunsford, Lucy	Home	MSc by Research School of Den	Ongoing
Eadie, Hannah	Home	PhD School of Dentistry Lab FT	Graduated March 2019
Ebong, Aniekan	Overseas	PhD School of Dentistry Lab FT	Ongoing
Elsworthy, Richard	Home	PhD School of Sprt+Ex Scie FT	Ongoing
Fenton, Anthony	Home	PhD Inflamm + Ageing FT (A300)	Thesis Awaited
Fernandes Zancan, Rafaela	Overseas	PG VRS Dentistry FT C500	Ongoing
Franks, Sarah	Home	MSc by Res Dentistry PT (A400)	Ongoing
Gill, Harmmeet	Home	PhD School of Dentistry Lab FT	Thesis Awaited
Green, David	Home	MSc by Res Dentistry PT (A400)	Thesis Awaited
Hamidi, Ahmed Samir	Home	PhD Integ St Phy Sci Health FT	Ongoing
Haria, Paras	Home	MSc by Research School of Den	Ongoing
Jayachandran, Sivakumar	Home	PhD School of Dentistry Lab PT	Ongoing
Kapralos, Vasileios	Home	PG VRS Dentistry FT A400	Graduated July 2018
Kelly, Robert	Home	PhD School of Dentistry Lab PT	Thesis Awaited
Kennefick, Jack	Home	PhD School of Chemistry FT	Ongoing
Khan, Ikra	Home	PhD Int St Innov Metal Proc FT	Ongoing
Koanantkul, Chuta	Overseas	MSc by Res Dentistry FT (H161)	Ongoing
Koutroulis, Andreas	Home	MSc by Res Dentistry FT (A400)	Thesis Awaited
Laverty, Dominic	Home	MSc by Res Dentistry PT (A400)	Ongoing
Lewin, Sean	Home	PhD School of Dentistry Lab FT	Ongoing
Liu, Siyun	Overseas	PhD Dentistry FT (H161)	Ongoing

Lopez-Lago, Aaron	Home	MSc by Res Dentistry PT (A400)	Withdrawn
Louzada, Lidiane	Overseas	PG VRS Dentistry FT A400	Graduated November 2018
Manhota, Menisha	Home	PhD Integ St Phy Sci Health FT	Ongoing
Matos, Felipe de Souza	Overseas	PG VRS Dentistry FT A400	Graduated December 2018
Mehta, Aarti	Home	MSc by Research School of Den	Graduated July 2018
Merand, Raphael	Home	PG VRS Dentistry FT A400	Soon to Start
Moetazedian, Amirpasha	Overseas	MSc by Research School of Den	Graduated July 2018
Moghimi, Fatemeh	Home	PhD School of Dentistry Lab FT	Ongoing
Mountcastle, Sophie	Home	PhD Integ St Phy Sci Health FT	Ongoing
Muchova, Maria	Home	MSc by Res Dentistry FT (A400)	Ongoing
Mukinay, Tatiana	Home	PhD Int St Innov Metal Proc FT	Thesis Awaited
Mungall, Rebecca	Home	PhD Dentistry FT (A400)	Ongoing
Natarajan, Jasper Kirubakaran	Overseas	PhD Dentistry FT (B100)	Soon to Start
Oglah, Firas Saddam	Overseas	PhD School of Dent Non-Lab FT	Graduated June 2018
Olaleye, Oladejo	Home	PhD Cancer + Genomic FT (A300)	Graduated December 2018
Patel, Anish	Home	MSc by Research School of Den	Thesis Awaited
Patel, Chandni	Home	MSc by Research School of Den	Ongoing
Patel, Yatisha	Home	MSc by Res Dentistry PT (A400)	Ongoing
Piexe Domingos Alves Pires, Mariana	Home	PG VRS Dentistry FT A400	Graduated October 2018
Poveda Gallego, Ana	Home	MSc Res Inflam & Age PT (A300)	Ongoing
Raja, Abida	Home	PhD School of Dent Clin PT	Thesis Awaited
Ridsdale, Lucy	Home	MSc by Res Dentistry PT (A400)	Ongoing
Saeed, Naveed	Home	PhD School of Dentistry Lab FT	Thesis Awaited
Salomon Ibarra, Candy	Overseas	PhD School of Dent Non-Lab FT	Ongoing
Sanghera, Ripponjit	Home	MSc by Research School of Den	Graduated October 2018
Serrage, Hannah	Home	PhD School of Dentistry Lab FT	Thesis Awaited
Seville, Victoria	Home	PhD Integ St Phy Sci Health FT	Ongoing
Sharma, Praveen	Home	PhD School of Dentistry Lab FT	Graduated March 2019
Shoker, Satvir	Home	PhD Dentistry FT (A400)	Ongoing
Sultan Mohamed Abd Elhamed, Nessma	Overseas	PG VRS Dentistry FT A400	Ongoing
Vasconcelos, Rodrigo	Overseas	PG VRS Dentistry FT A400	Graduated November 2018

Virdee, Satnam	Home	MSc by Res Dentistry PT (A400)	Ongoing
White, Cleo	Home	PhD School of Dentistry Lab FT	Thesis Awaited
Wongviriyaya, Adjabhak	Overseas	PhD Dentistry FT (B100)	Ongoing
Yonel, Zehra	Home	MSc by Res Dentistry PT (A400)	Ongoing

Indicators of Esteem and Research Impact

Leadership Roles

Our researchers undertake a range of **national and international leadership roles** and **committee memberships** of national and international professional societies. Examples include the items below (all current):

- **Camilleri**, British Society for the Oral and Dental Research (BSODR) Management Committee Member
- **Chapple**, Treasurer of the UK Oral and Dental Research Trust
- **Chapple**, Secretary General of the EFP
- **Cooper**, BSODR Management Committee Member
- **Cooper**, BSODR Mineralised Tissue Research Group (MINTIG) Chair
- **Dietrich**, President of the British Association of Oral and Maxillofacial Surgeons (ABAOMS)
- **Kuehne**, BSODR Oral Microbiology and Immunology Group (OMIG) Committee Member
- **Kuehne**, Prokaryote Division Committee Member of the Microbiology Society
- **Milward**, Council Member of the British Society of Periodontology
- **Palin**, Board Member and Chair of the Marshall Postdoctoral Award, Academy of Dental Materials
- **Patel**, British Society of Prosthodontics Committee Member
- **Scheven**, BSODR MINTIG Committee Member
- **Sharma**, BSODR Management Committee Member
- **Tomson**, British Endodontic Society Committee Member
- **Tomson**, European Society of Endodontology Committee Member
- **Walmsley**, British Dental Association Scientific Adviser

Clinical Standards

We influence **national and international clinical standards** through committee memberships:

- In February 2018 **Chapple** chaired a joint workshop between the European Federation of Periodontology and the International Diabetes Federation, to develop recommendations for the periodontal management of diabetes
- **Chapple** recently co-chaired a new global classification of periodontal diseases and conditions and peri-implant diseases, published in June 2018
- In February 2019 **Chapple** established and co-chaired a joint workshop between the European Federation of Periodontology and the World Heart Federation, to develop recommendations for the periodontal management of cardiovascular complications
- **Chapple**, **Dietrich** and **Yonel** recently informed a NHS England Commissioning Standard in Dental and Diabetic Medicine
- **Camilleri** is a committee member of the Medical and Surgical Materials and Devices team for American Standards for Testing Methods, an international organisation with responsibility for the development and publication of voluntary consensus technical standards

- **Palin** is a committee member of the British Standards Institute and International Standards Organisation for CH/106/1 (Dental Restorative and Orthodontic Materials) and CH/106/2 (Prosthodontic Materials)

Commercial Influence

A number of our senior investigators (**Camilleri, Chapple, Khambay, Palin, Tomson, Walmsley**) are frequently invited and supply **specialist advice and consultancy** to businesses: thus we influence the commercial research and development programmes of these organisations, with regular representation within the scientific advisory boards of GSK, Unilever, Philips Oral Healthcare, Johnson & Johnson, Mars, Colgate, Attenborough Dental, Septodont, 3M, Ivoclar, Voco, and FKG.

Our studies of biomarkers and underpinning technologies have particularly influenced the global research and development strategies of Unilever, Philips and Mars: we have enabled these companies to **realise new markets** and prompted **several £million investments** in studies of products both under investigation and already available on shelves. For example, monies from Philips have supported our state-of-the-art proteomic analyses of saliva to measure treatment outcomes, and to differentiate periodontal health from gingivitis and periodontitis. **Ten US patents** have been filed in collaboration with Philips to exploit these results, along with four in China, Japan and Korea.

Our **spin-out companies** continue to move from strength to strength in development of technologies to facilitate personalised medicine. **Oral Health Innovations Ltd** has turned over £1.1 million in the establishment of online risk and disease analysis software for oral conditions. Our PreViser, DEPPA and YDEPPA tools operate within electronic patient directories used routinely by general dental practitioners nationwide. They have been piloted, adopted and launched by 5 major providers of dental insurance systems including DenPlan, the largest dental capitation plan operator (6,500 dentists and 1.8 million patients). Indeed DenPlan parented by SimplyHealth now uses DEPPA to drive individual patient capitation banding recommendations. Meanwhile **GFC Diagnostics Ltd** has harnessed our biomarker research to develop a non-invasive, sensitive and objective saliva test, SmokeScreen.™ We are confident that in the future saliva biomarker analysis is likely to inform periodontal disease staging during classification.

Societal Influence

- *Periodontal Health*

Our epidemiological studies and mechanistic experiments unravelling the biological mechanisms of association between periodontitis and systemic non-communicable diseases have provided key evidence to inform national international clinical recommendations with influence on daily practice:

- **European Federation of Periodontology - International Diabetes Federation Consensus Guideline 2018**, directed at physicians, oral healthcare practitioners and patients in medical and dental practices
- **European Federation of Periodontology - World Heart Federation Consensus Guideline 2019**, directed at medical and oral healthcare practitioners

Meanwhile our work with patients and the public, and our contributions to a health economic analysis for NHS England, have informed a commissioning standard in the periodontal management of diabetes, and especially the role of dentists in diabetes detection, control and management:

- **NHS England Commissioning Standard in Dental and Diabetic Medicine 2018-2019**, directed at clinical commissioners, physicians and dental care professionals, to determine minimum expectations of care

Our studies of periodontitis-associated mortality and periodontitis-induced oxidative stress, dyslipidaemia and hyperglycaemia also demonstrate societal impact through media attention and textbooks to inform both public and professional readers about these issues.

- International press/media interest has included a **BBC1 primetime television** documentary telling **The Truth About Your Teeth**, alongside reports in the Telegraph, Mail, Times Higher Education, and newspapers in Spain, Germany, Portugal, Canada and other countries
- In 2019 Quintessence Germany published a textbook about periodontal-systemic interactions, with **Hirschfeld** and **Chapple** as editors and authors
- Quintessence Germany has also developed two public videos of (1) the biological mechanisms connecting periodontal disease to cardiovascular disease and diabetes, and (2) the biological processes involved in peri-implant disease development and management, with **Chapple** as a consultant to the project

▪ *Technologies to Facilitate Personalised Medicine*

Over the last 20 years, we have developed a range of precision technologies to identify and stratify patients at risk of oral diseases, and to provide personalised information to guide behaviour change, empowering patients to take responsibility for their own oral health. The tools generated by our spin-out companies bring societal advantages alongside commercial benefits (described above).

For example, independent research has demonstrated significant psychological and clinical health benefits of patient education facilitated by software supplied by Oral Health Innovations Ltd. Researchers from Kings College London recognised **improved self-efficacy, understanding and motivation** (2015) plus **improved engagement with healthcare practitioners** (2017) and **improved health behaviours and clinical outcomes** (2019) among patients whose healthcare practitioners used PreViser and DEPPA tools.

The validated tools, described by the Editor-in-Chief of the British Dental Journal as **truly field changing**, are available free of charge for education within several dental schools, and recently contributed to the algorithms that underpin the comprehensive oral health assessments of new dental contracts executed by NHS England. Oral Health Innovations Ltd additionally offers a free risk assessment application for lay users, to raise public awareness of oral health. The MyDentalScore tool achieved 6,500 uses in 2018 via the SimplyHealth corporate site alone.

Oral Health Innovations Ltd donates profits to national charities such as the Oral and Dental Research Trust, to finance pilot studies of new possibilities to improve public health. Since 2015 more than £120,000 has been donated to enable 22 research grants to a wide range of oral health professionals at all career stages.

Academic Influence

Our research excellence is reflected by **senior editorial and advisory positions and external examination roles** listed below (all current):

- **Camilleri**, Associate Editor of the Journal of Applied Oral Science, Iranian Endodontic Journal, and Journal of the Lebanese Dental Association
- **Camilleri**, Advisor to the Research Grants Council of Hong Kong
- **Chapple**, Editor-in-Chief of the Journal of Clinical Periodontology Digest
- **Chapple**, Associate Editor of the Journal of Clinical Periodontology
- **Chapple**, Guest Editor of Periodontology 2000
- **Cooper**, Editorial Board Member of the Journal of Dental Research, Journal of Periodontal Research, Journal of Endodontics, and Journal of Dentistry
- **Cooper**, Advisor to the King Abdullah International Medical Research Centre, Saudi Arabia

- **Dietrich**, Editorial Board Member of the Journal of Dental Research
- **Palin**, Editorial Board Member of the International Journal of Adhesion and Adhesives, Dental Materials Journal, Journal of Biomaterial Applications, Dental Materials, Journal of Dentistry, and Journal of Applied Oral Science
- **Palin**, Editor-in-Chief of the European Journal of Prosthodontics and Restorative Dentistry
- **Palin**, External Examiner for King's College London, Hong Kong University, and University of Sheffield
- **Tomson**, Editorial Board Member of the International Endodontic Journal
- **Walmsley**, Editorial Board Member of the British Dental Journal (BDJ), Dental Update, and European Journal of Restorative Dentistry

Educational Influence

We continuously strive to ensure the dental education we offer is truly world-leading: we aim not just to adopt best practice, but to pioneer it. Thus we encourage **educational innovation**. Working with collaborators from Nottingham Trent University, in late 2018 **Milward** and **Cooper** developed a unique biofidelic model for training in periodontal probing. Probing around teeth to measure tissue detachment is crucial to enable diagnosis of gum disease. The clinical assessment is part of routine care in daily dental practice, but if not performed correctly then patients cannot receive early and appropriate treatment to avert tooth loss. Previously standard teaching practice has not enabled students to experience accurate probing models prior to the treatment of real patients. However the innovative biofidelic model developed by our team is now introduced to the undergraduate curriculum at UoB. Responses from students are overwhelming, with 96% agreeing that the model helps them to prepare for clinical practice and increases their confidence.

Prizes

Our researchers continue to be recognised with **prizes and awards at the highest levels internationally** in the year to date:

- **Camilleri**, 2018 Louis Grossman Prize, American Association of Endodontists
- **Chapple**, 2018 Distinguished Scientist in Periodontal Research, IADR
- **Chapple**, 2018 Special Citation Award of the American Academy of Periodontology
- **Sharma**, 2018 Ivor Whitehead Prize, British Dental Association
- **Milward** and **Cooper**, 2019 Educational Innovation of the Month, UoB

Learning Disabilities service

Annual Research Report from LD Division 2018/19

Organisation and Environment

New Personnel have now joined the LD Division to support Research and Innovation within the clinical teams in the LD Service. Amar Sultan Interim Governance Manager, Elaine Malkin and Charity Adamson, Governance Support, recently taken up these newly created roles. Rachael Garvey Divisional Director of Nursing & Therapies for Governance and Tonye Sikabofori Divisional Medical Director for the Learning Disability Division for Clinical effectiveness oversee the research and innovation of the service.

Research aspirations

To fund for provision of an LD Divisional Research Assistant at Band 4/5 level to correlate and support research and Audit activities and support Governance/Clinical Effectiveness in LD.

To include service user involvement within research related activities in LD Division via Patient Lead, PEN and outside organisations eg. Mencap

To build relationships within BCHC and support promoting a research Forum within the BCHC

To improve contacts with Universities eg Cerebra Birmingham University and Coventry University and work to with BCHC R&I team to embed Academics (from all 5 universities) into clinical slots in LD.

To build on research activity within the LD service, through support (CRAG, CRG) and annual events eg. BCHC and stand-alone LD Clinical Effectiveness Days and showcasing events to celebrate research and audit.

Planned events

- October 2019 LD Division Research and Clinical Effectiveness Away Day
- Introduction of Clinical Research and Audit Group (CRAG) to LD Service June 2019 (replacing Research Interest Group (RIG)). Planned to embed this into Clinical Reference Groups.
- CRAG showcasing event twice a year
- PPP focus and joint work with Uni's/Mencap October 2019
- EMDR Project (Psychology) launch and support

Interdisciplinary Collaborations

- Collaborative research projects with universities:

- Aston – Autism and Physical Health -Psychology
- UoB & Bangor University –Forensic Team
- Establishing Academic Clinical posts in LD Division
- Collaborative work between LD Division (PEN lead) and Mencap for improved joint working

Research

Waheeda Kodabakus Community Nurse :

“A Register for collecting and measuring outcomes in licenced Anti-Epileptic Drugs in patients with Epilepsy and Intellectual Disability and/or Pervasive Developmental Disorders”

Laura White Occupational Therapy

Laura has submitted a qualitative research study to Ulster Uni on ‘Occupational therapists perception and use of outcome measures for adults with an intellectual disability’ as part of her Masters.

Planned Research

Psychology:

“Eye Movement Desensitisation and reprocessing for symptoms of post-traumatic stress disorder in adults with learning disabilities. A NIHR HTA programme project”

Grants Awarded

Research funding:

Eye Movement Desensitisation and reprocessing for symptoms of post-traumatic stress disorder in adults with learning disabilities (EMDR). A NIHR HTA programme project. Awarded £535,304 (excluding NHS support costs). Co-applicant. 2018

Already recorded in 2019 EDGE Report

NIHR Mental Health BioResource for Depression and Anxiety Non-commercial portfolio
Expression of interest Yes

A Register for New Anti-Epileptic Drugs in ID/PDD populations TBC Non-commercial portfolio
Feasibility Yes

Investigation of Genes for Alzheimer’s disease in Adults with Down syndrome. Prasher, Vee
Feasibility Yes

Exploring the understandings and experiences of sex offenders with intellectual disabilities who have attended the adapted Sex Offender Treatment Programme. Browning , Ms Morna Non-commercial non-portfolio Project site in setup Yes

Eye movement desensitisation and reprocessing for symptoms of post-traumatic stress disorder in adults with learning disabilities Willott, Dr Sara Non-commercial portfolio Project site in setup Yes

Autism Conditions in Adulthood - Learning about the lives of adults on the autism spectrum and their relatives Bisnauth, Dr Radha Non-commercial portfolio Open Yes

UKCRN no 13550 Narratives of health and illness for www.healthtalkonline.org (formerly DIPEX) and www.youthhealthtalk.org Ziebland, Prof Sue Non-commercial portfolio Open Yes

West Midlands Combined Authority Health-led Trial Watson, Dr Anne Non-commercial portfolio Open Yes

Research publications

Unwin GL, Willott S. & Stenfert Kroese B. (in preparation). Eye Movement Desensitisation and Reprocessing for People with Intellectual Disabilities: A Review

Willott, S.A., Badger, W. & Evans, V. (in preparation) Sexual abuse of people with an intellectual disability: Exploring under-reporting. To be submitted to The Journal of Adult Protection

Unwin GL, Willott S. & Stenfert Kroese B. (accepted/ in press). Eye Movement Desensitisation and Reprocessing for People with Intellectual Disabilities: Process Issues from an Acceptability Study. Journal of Applied Research in Intellectual Disabilities

Stokoe, E., Antaki, C., Richardson, E. & Willott, S. (chapter accepted for publication) When police interview victims of sexual assault: Comparing written guidance to interactional practice. In The Discourse of Police Interviews (Eds) University of Chicago Press

Stenfert-Kroese, B, Willott, S., Taylor, F. et al (2016) Trauma Focused Cognitive Behaviour Therapy for people with mild Intellectual Disabilities: outcomes of a pilot study. Advances in Mental Health & Intellectual Disabilities, 10(5): 299-310

Postgraduate Students

- | | | | |
|-----------------------|-----|----------------|----------|
| • Rachel Kasch | SLT | Masters (MRes) | on-going |
| • Waheedan Kodabuckus | CN | Masters | on-going |
| • Laura White | OT | Masters | on-going |
| • Sanjeev Badwal | OT | Masters | on-going |

Abbreviations

ABF	Activity Based Funding
AHSN	Academic Health Science Network
BA	Business Assists
BCHC	Birmingham Community Healthcare NHS Foundation Trust
CAIP	Clinical Academic Internship Programme
CRN	Clinical Research Network
ERDF	European Regional Development Fund
HLO	Higher Level Objectives
ICAP	Integrated Clinical Academic Programme
IP	Intellectual Property
IE2	Innovation Engine 2
MSK	Musculoskeletal
NIHR	National Institute for Health Research
PID	Performance in Initiating and Delivering Clinical Research
R&I	Research and Innovation
RCF	Research Capability Funding
SME	Small to Medium Enterprise
MHH	Moseley Hill Hospital
UK	United Kingdom
UOB	University of Birmingham
WM	West Midlands
WTE	Whole Time Equivalent
VIF	Virtual Innovation Forum