National Institute for Health Research

NIHR Maudsley Biomedical Research Centre

PhD Studentships

Project Catalogue

Lifestyle Substance Use and Harms

Studentships to commence October 2017

Contents

NIHR Maudsley Biomedical Research Centre (BRC)

NIHR Biomedical Research Centres are funded to support people- and/or patient-focused early translational (experimental medicine) research, the aim of which is to translate discoveries from basic/discovery science into clinical research, and through to benefits for patients, the health system and for broader economic gain.

On September 16 2016 the Secretary of State for Health announced that the Department of Health has awarded £66 million funding over the next five years to the National Institute for Health Research (NIHR) Biomedical Research Centre (BRC) at South London and Maudsley NHS Foundation Trust and the Institute of Psychiatry, Psychology & Neuroscience at King's College London.

The award represents a substantial uplift in funding compared to the previous BRC funding round, and demonstrates the government's continued commitment to the current NIHR Maudsley BRC, allowing the research centre both to build on its current work and expand into new areas including substance use, obesity, pain and mobile health technology.

The expanded NIHR Maudsley BRC will bring together scientists, clinicians, mental health professionals, service users and carers, to improve clinical care and services across the field of mental health. The investment in the NIHR Maudsley BRC will allow research into ground-breaking treatments and care for mental health and dementia.

NIHR Maudsley BRC Strategy

There are four major elements to the NIHR Maudsley BRC strategy for the coming 5 years, reflected in aims of the 17 themes:

- **Precision psychiatry**: Bringing together insights from cognition, behaviour, genomics and brain imaging, we will develop biologically-informed strata of psychiatric syndromes, with the ambition to develop and provide more individually tailored treatment
- **Novel therapeutics**: Using the access to our large databases, electronic consent for contact procedures, and our dedicated experimental medicine Clinical Research Facility (CRF), we will undertake trials of new pharmacological, neuromodulation and psychological treatments
- **Translational informatics**: By using our bespoke natural language processing algorithms and 'smart agents', we will use informatics to influence treatment choice, increase adherence, improve health behaviours and increase patient empowerment, all of which will benefit patient outcomes and service delivery
- **Mental/physical interface**: We will decrease the 15 years of life lost to serious mental illness by using informatics to identify, prioritise and track the treatment of those with comorbid mental and physical disorders

Clinical disorder focused research themes

Seven clinical disorder focused research themes cover mental health and dementia from cradle to grave:

- Affective Disorders and Interface with Medicine
- Child and Neurodevelopmental Disorders
- Dementia and Related Disorders
- Lifestyle Substance Use & Harms (Substance Use)
- Obesity, Lifestyle and Learning from Extreme Populations (Obesity)
- Pain and headache
- Psychosis and Neuropsychiatry

Technology and methodology focused research themes

Seven technology and methodology focused research themes develop and deploy new approaches to clinical problems:

- Bioinformatics and Statistics
- Biomarkers and Genomics
- Clinical and Population Informatics
- Mobile Health
- Neuroimaging
- Patient and Carer Involvement and Engagement
- Translational Therapeutics

Cross cutting themes

Three cross cutting themes provide enabling infrastructure:

- BioResource
- Clinical Research Facility
- Training and Capacity Development

Lifestyle Substance Use & Harms (Substance Use)

Lead: Professor Sir John Strang

This theme covers use of tobacco, alcohol and illegal substances in general populations outside addictions treatment, aiming to develop better understanding of the connections between substance use and harms, and to investigate novel interventions and specialist treatment options to address substance use before it causes substantial health problems, including addiction, or to reverse or reduce harms when incurred. It will take a precision medicine approach to cohorts from general healthcare, identifying critical transition points in LSU (Lifestyle Substance Use) to harmful substance use for stratified populations. It will devise and test novel therapeutic approaches (psychological, pharmacological, mobile health), and use translational informatics to test interventions embedded within systems of care.

Aims

1. Identify at-risk groups and investigate critical transition points in substance use trajectories
2. Develop behavioural interventions and novel therapies which alter substance use trajectories
3. Conduct experimental studies of harms and the potential to prevent

Projects

When applying for the NIHR Maudsley Biomedical Research Centre PhD studentship in the **Lifestyle Substance Use and Harms** theme, please ensure you state your two preferred PhD projects from those listed in this catalogue only. These should be listed in order of preference and include the number that is assigned to the project and the project title.

For example:

1. LSUH-2.04 Using electronic health record data for clinical risk prediction: Application of liver disease
2. LSUH-2.01 Initiations and transitions of substance use patterns during and subsequent to military service

Important: With your application, in addition to the personal statement, please upload a separate single-side A4 document listing your first and second choice projects with a statement explaining why you have chosen your **first choice** project and why you would like to take this forward as a PhD (**maximum 300 words**).

If you wish to discuss a project before you apply, you will find supervisors' names and their contact details listed with each project in this catalogue.

Further information about project supervisors can be viewed in the King's College London Research Portal. Under **Researchers**, type the name of the person you wish to view information about.

Please note: The final choice of funding, project and project details are agreed after successful interview.

The projects offered for the studentships in this theme are grouped into 3 research study areas. We aim to award at least one PhD studentship for each of the three study areas described below:

Research Study Area	Project Reference	Project Title	Supervisors
A) Critical transition points and trajectories in LSU (Lifestyle Substance Use) in at-risk groups;	**LSUH-2.01**	Initiations and transitions of substance use patterns during and subsequent to military service	Nicola Fear / John Strang
	LSUH-2.02	Using Ecological Momentary Assessment to assess drug treatment and need for treatment post prison release	Michael Lynskey / John Strang
B) Experimental studies of the genesis of harms and potential to prevent	**LSUH-2.03**	Heroin and opioid overdose: developing wearable sensors to detect and respond	John Strang / Richard Dobson
	LSUH-2.04	Using electronic health record data for clinical risk prediction: Application of liver disease	Kate Morley / Robert Stewart
	LSUH-2.05	Respiratory risk among heroin/opiate addicts: exploring poor recognition and testing indices of harm	Caroline Jolley / John Strang
	LSUH-2.06	In vivo, mechanistic investigation of opioidergic activity and its reversal: acute effects of heroin and Fentanyl and overdose reversal using physiological MRI	Fernando Zelaya / John Strang
C) Development and testing of novel interventions and their ability to prevent substantial health problems or to reduce harms when incurred	**LSUH-2.07**	Development and testing of novel electronic health interventions to alter drugs, alcohol and tobacco use patterns and trajectories in young people	Paolo DeLuca / Colin Drummond
	LSUH-2.08	Maintaining abstinence from smoking after a period of enforced abstinence	Ann McNeill / Leonie Brose
	LSUH-2.09	Exposure and Augmented Reality Therapy: A Novel Cognitive Therapy for Substance Dependence	John Marsden / John Strang
	LSUH-2.10	Transitions to less harmful ways of consuming nicotine among intransigent smokers	Leonie Brose / Ann McNeill

Please see project details on following pages for full information about each.

Please note: The final choice of funding, project and project details are agreed after successful interview.

LSUH-2.01 Initiations and transitions of substance use patterns during and subsequent to military service

Primary Supervisor: Professor Nicola Fear

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Second Supervisor: Professor Sir John Strang

Academic Department: Addictions

Email: john.strang@kcl.ac.uk

Project Description

1) Investigation of atypical early transitions and progressions of substance use patterns in military vs civilian populations;
2) Impact of key occupational challenges and life transitions on drug and alcohol use in military vs civilian populations.

Recent research has demonstrated that rapid transition from first to second use of cannabis is strongly associated with daily use of cannabis, of cannabis abuse and dependence and of cannabis-related treatment-seeking behaviour (Hines et al., 2015). In addition, research undertaken by Chen et al. (2005) identified lower parental involvement and higher levels of coercive discipline as associated with increased likelihood of cannabis use opportunity.

Data released by MoD following a Freedom of Information request indicates that drug use in the military population is on the increase, notwithstanding the MoD's 'zero-tolerance' drugs policy. To date, little research into illicit substance use in military and former military personnel has been carried out. It is therefore not known how drug use in military personnel is initiated, transitions and progresses. For example, does military service interrupt or disrupt progression either on a temporary or permanent basis? Do the unique stressors of frequent re-locations and active service act to accelerate or decelerate progression in military personnel?

Also, do the timings of opportunity, initiation and progression differ from the civilian population? Does later drug use and dependence derive from initiation prior to commencing military service or do initiation and progression occur during or after military service? And how do drug use patterns change for former military personnel? Do transitions and progressions mirror those of the civilian population or are they more or less likely to progress to different substances and different methods of administration?

Scope of PhD student contribution: The PhD student will address the following areas:

(I) a structured review of the topic area, including systematic search by specified keywords and well as informed search through key informants;

(II) PPI interviews (probably a limited number of focus groups, perhaps supplemented by a few in-depth one-to-one interviews) of acceptability and confidence in different possible interview methods;

(III) cross-sectional survey of the relevant target population (perhaps split across two or three interview methods (e.g. on-line questionnaire versus paper questionnaire versus phone);

(IV) if time permits, a follow-up interview (by the method that emerges as best method);

(V) various different approaches to analysis.

LSUH-2.02 Using Ecological Momentary Assessment to assess drug treatment and need for treatment post prison release

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Second Supervisor: Professor Sir John Strang

Academic Department: Addictions

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Project Description

Substantial minorities of the prison population have a history of injecting drug use and are at risk for rapid reinstatement of frequent or problematic drug use immediately after release from prison. Ecological momentary assessment (EMA) utilizes mobile phones and related technologies to collect real-time information on patterns of drug use and related behaviors and is ideally suited for studying rapidly changing behaviours over brief time periods where more traditional data collection techniques may be compromised by inaccuracies in retrospective reports. The aim of this project will be to develop and test the feasibility of implementing EMA to both assess patterns of drug use and related phenotypes (e.g., craving) post prison release and to identify the need for, and enhance pathways into treatment.

Objectives:

Year 1: Complete a systematic review evaluating interventions for drug use among individuals leaving prison. Conduct a cross-sectional survey of the target population examining mobile phone ownership, usage and willingness to participate in research after prison release.

Year 2: Complete development and conduct initial feasibility test of EMA system for use post prison.

Year 3 & 4: Implement pilot project to evaluate the efficacy of collecting EMA data on patterns of drug use after release from prison and to evaluate the efficacy of this system for identifying treatment/ intervention needs and for facilitating entry into treatment.

Training:

This project will provide the student with training in all aspects of research including data collection as well as training in advanced statistical methods for the analysis of EMA data.

Representative publications from supervisors:

1: Milward J, Day E, Wadsworth E, Strang J, Lynskey M. Mobile phone ownership, usage and readiness to use by patients in drug treatment. Drug Alcohol Depend. 2015; 146: 111-5.

2: Strang J, Bird SM, Parmar MK. Take-home emergency naloxone to prevent heroin overdose deaths after prison release: rationale and practicalities for the N-ALIVE randomized trial. J Urban Health. 2013 Oct;90(5):983-96.

LSUH-2.03 Heroin and opioid overdose: developing wearable sensors to detect and respond

Primary Supervisor: Professor Sir John Strang

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Second Supervisor: Professor Richard Dobson

Academic Department: Social, Genetic and Developmental Psychiatry

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Project Description

Deaths from heroin/opioid overdose could be prevented if devices could detect overdose onset and activate emergency response. This PhD will investigate wearable sensors to detect physiological indicators of overdose and will explore their technological and operational functionality.

There is a world-wide progressively worsening 'opioid overdose epidemic' (CDC, 2015), with most drug-related deaths involving illicit heroin or prescription opioids. In the UK there has been a doubling in heroin overdose deaths since 2011 (Middleton, BMJ, 2016). Globally opioid overdose results in 70,000-100,000 deaths annually (WHO, 2014).

Heroin overdose deaths result from sudden respiratory down-regulation. Overdose is rapidly reversed by injection of naloxone (antagonist). Deaths frequently occur from failure to detect, and consequent failure to summon help. Wearable sensors could monitor vital signs and automatically summons emergency response.

This PhD will develop and test ability to track, on an ambulatory basis, physiological indices of respiratory function (and perhaps cardiac function and intercostal muscle activity) and will investigate the ability of sensors (both bench-based and prototype wearable and remote) to detect, at an early stage, heroin/opioid overdose. The devices should also activate emergency response.

The student will have an interest in software development, data science and more generally, an interest in evaluation of mobile technology for health.

There may also be opportunity to study prototype devices on current heroin/opioid users, in a dedicated clinical research facility (CRF), to establish ability to detect onset of acute heroin/opioid overdose, examining which physiological parameters are most suitable for mobile monitoring technologies.

Keywords: heroin; overdose; wearable; sensors; detection;

Representative publications from supervisors:

1: Jolley CJ, Bell J, Rafferty GF, Moxham J & Strang J. Understanding Heroin Overdose: A Study of the Acute Respiratory Depressant Effects of Injected Pharmaceutical Heroin. PLoS One. 2015 Oct 23;10(10):e0140995. doi: 10.1371/journal.pone.0140995. eCollection 2015. Erratum in: PLoS One. 2015;10(11):e0143672. PubMed PMID: 26495843; PubMed Central PMCID: PMC4619694.

2: Strang J. Death matters: understanding heroin/opiate overdose risk and testing potential to prevent deaths. Addiction. 2015 Jul;110 Suppl 2:27-35. doi: 10.1111/add.12904. PubMed PMID: 26042565.

LSUH-2.04 Using electronic health record data for clinical risk prediction: Application to liver disease

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Second Supervisor: Professor Robert Stewart

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Project Description

Background: Electronic health record (EHR) systems contain data from clinical practice for millions of patients across multiple healthcare domains providing a valuable source of data for developing clinical risk prediction tools. However, these data are observational and can be incomplete. Linking data collected via "traditional" epidemiological surveys to EHR data provides an opportunity to compare how patient risk factors, diagnoses, and treatment are characterised in different data sources, and can thus inform both the development of risk prediction tools and clinical practice. This project will use this approach to develop a risk prediction tool for liver disease, an important consequence of lifestyle substance use.

Aim: To combine electronic health records (EHR) with data collected via "traditional" epidemiological surveys to develop computational tools that can assist clinical staff to identify addiction services clients at high risk of liver disease.

Design:

Project 1: Survey a large sample of addiction services clients and link their questionnaire responses to their EHR. The questions will cover lifestyle substance use and associated factors that affect risk of liver disease. The linked data set will be used to determine what is *not* being captured in the EHR, leading to improvements in extraction of information from EHR data and clinical recording.

Project 2: Using the linked survey-EHR data set from Project 1, develop a risk prediction model for liver disease. The model will initially be developed using only data available in the EHR; further analyses will investigate whether information not currently well-captured in the EHR can improve model performance by including of variables from the survey data.

Project 3: Based on the model from Project 2, develop computer-based decision-support tools that can be used by clinical staff to: (i) estimate an individual client's risk of developing liver disease; (ii) translate statistical estimates into clinically meaningful information that supports patient education (e.g. graphical tools); (iii) inform discussions between staff and clients about treatment options. Input from staff and clients will be sought via interviews and focus groups to ensure these tools are relevant and useful from their perspectives.

Skills learned: large-scale data analysis; advanced statistical analysis; qualitative research.

Keywords: epidemiology; electronic medical records; risk prediction;

Representative publication from supervisors:

1: Morley KI, Wallace J, Denaxas SC, Hunter RJ, Patel RS, Perel P, Shah AD, Timmis AD, Schilling RJ, Hemingway H. Defining disease phenotypes using national linked electronic healthrecords: a case study of atrial fibrillation. PLoS One. 2014 Nov 4;9(11):e110900.

LSUH-2.05 Respiratory risk among heroin/opiate addicts: exploring poor recognition and testing indices of harm

Primary Supervisor: Dr Caroline Jolley

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Second Supervisor: Professor Sir John Strang

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Project Description

Background: Opioids are respiratory depressants and heroin/opioid overdose is a major contributor to the excess mortality of heroin addicts. The individual and situational variability of respiratory depression caused by intravenous heroin is poorly understood. Using physiological measures of respiratory muscle electromyogram activity to quantify neural respiratory drive (NRD), we have shown that chronically-suppressed NRD may be associated with an increased risk of acute opioid-induced respiratory depression (Jolley et al, PLOS ONE 2015). Since breathlessness is closely related to levels of NRD (Jolley et al, ERJ 2015), a "blunted" perception of impending critical respiratory insufficiency could contribute to increased risk of drug-related death. Objective, rather than subjective, markers of respiratory status would be of value for monitoring this at-risk population.

Year 0 – 1: Study 1: To test the hypothesis that chronic opioid-induced respiratory depression is associated with blunted perception of breathlessness during an acute hypercapnic respiratory challenge.

Year 0 – 2: Study 2: To assess the feasibility of routine monitoring of objective physiological markers of respiratory depression within Addictions treatment services, with the aim of reducing the risk of overdose and respiratory-related hospital admissions compared to usual care alone. Within this, investigation of the influence of personal characteristics (age, gender, respiratory disease) and medication characteristics (which drug, dose, route, co-medications, alcohol, etc) on overdose risk.

Year 2 -3: Writing of thesis and preparation of manuscripts for submission to peer-reviewed journals. PhD Viva

Skills training: Physiological measurement including, hypercapnic respiratory challenge testing and measurement of parasternal intercostal muscle electromyogram activity. Statistical methods. Clinical trials.

Keywords: Drug overdose; Heroin; Respiratory Insufficiency; Dyspnea; Respiratory muscles/physiology;

Representative publications from supervisors:

1: Jolley CJ, Bell J, Rafferty GF, Moxham J, Strang J. Understanding Heroin Overdose: A Study of the Acute Respiratory Depressant Effects of Injected Pharmaceutical Heroin. PLoS One. 2015 Oct 23;10(10):e0140995.

2: Strang J. Death matters: understanding heroin/opiate overdose risk and testing potential to prevent deaths. Addiction. 2015 Jul;110 Suppl 2:27-35. doi: 10.1111/add.12904. PubMed PMID: 26042565.

LSUH-2.06 In vivo, mechanistic investigation of opioidergic activity and its reversal: acute effects of heroin and Fentanyl and overdose reversal using physiological MRI

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Project Description

In vivo, mechanistic investigation of opioidergic activity and its reversal: acute effects of heroin and Fentanyl and overdose reversal using physiological MRI. We will establish a laboratory-based overdose model, measuring I.V. opioid effect and naloxone reversal (I.V., buccal). We will exploit functional MRI methods to determine the response to both enhancement and reversal of opioidergic brain activity, alongside concurrent pharmacokinetic and physiological measurements. We will pilot-test two novel naloxone formulations – a concentrated naloxone nasal spray and a novel buccal naloxone tablet.

Hypotheses: - IV fentanyl will increase regional CBF in the thalamus, lingual gyrus, insula, ventral striatum and brainstem. - Peripheral oximetry and capnography measures will correlate with CBF MRI measurements and pharmacokinetics. - NaloxoneIM will reverse opioid-induced regional CBF - A novel buccal naloxone tablet will have a speed of onset and duration comparable to IM.

Aims: - Employ innovative ASL methodology to measure regional CBF over the entire brain volume with a temporal resolution of ~60sec without signal dropout/distortion; - Assess the temporal dynamics of opioidergic brain activation and reversal following conventional and novel naloxone medications; - Examine within-subject and between-subject variability in response and establish the strength of this laboratory model of overdose reversal and naloxone brain imaging.

Impact: - Develop a safe laboratory model of opioid overdose adaptable to other pharmacotherapies in addictions research; - Demonstrate capability of acute respiratory depressant effects of an opioid agonist and its reversal by an opioid antagonist; - Establish the central effects of a new buccal naloxone tablet

Keywords: opioid addiction; Physiological MRI; opioid antagonist; opiodergic brain activity;

Representative publications from supervisors:

1: Resting hyperperfusion of the hippocampus, midbrain and basal ganglia in people at high risk for psychosis. Paul Allen, Chris Chaddock, Alice Egerton, Oliver Howes, Ilria Bonoldi, Fernando Zelaya, Robin Murray, Philip McGuire. American Journal of Psychiatry 173 (4), 392-9 (2016).

2: Strang J, Death matters: understanding heroine/opiate overdose risk and testing potential to prevent deaths. Addiction 110, 27-35 (2015).

LSUH-2.07 Development and testing of novel electronic health interventions to alter drugs, alcohol and tobacco use patterns and trajectories in young people

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Project Description

Systematic reviews report that opportunistic alcohol Screening and Brief Intervention (SBI) is effective and cost effective in reducing alcohol consumption, alcohol related harm, and NHS and criminal justice service use. The evidence base is strongest in the primary care setting, with further evidence of effectiveness in emergency departments and acute inpatient care (e.g. Kaner et al 2007). NICE (2010) recommends implementation of SBI in routine NHS care. However, only 2% of hazardous and harmful drinkers are identified annually in primary care in England, with significantly lower identification rates in 18-24 year olds than older patients. Therefore a cost effective and practical method of implementing SBI both in the NHS and delivered at a whole population level is urgently required.

SBI delivered via electronic media (eSBI) shows promise, with several clinical trials reporting positive outcomes. Currently most of this research has been via online or text message delivery. Recent reviews of the relevant literature (Donoghue et al 2014, Patton et al 2014) further supports the utilisation of eSBI to reduce alcohol consumption and related harms.

This PhD proposal focuses on the development, implementation and evaluation of a purpose designed smartphone intervention app which would focus on a number of health and lifestyle behaviours such as: Alcohol, smoking, drugs use as well as obesity and self harm. The app will be developed following proven brief intervention, gamification strategies, and augmented intelligence (ChatScripts) to personalise content, to promote healthier choices, to induce a reduction in quantity and frequency of substance use in adolescents, to provide a wider implementation and uptake of electronic brief interventions to the wider population, with associated health and cost benefits. The app development will involve qualitative research with target users through focus groups, interviews and product testing, in order to develop the most user friendly, credible and engaging intervention tool.

Scope of PhD student contribution:
The PhD student will be an integral part of the development, piloting and evaluation work.

Keywords: Adolescent; Alcohol; Tobacco; Prescription drugs; Health and Lifestyle; Electronic Intervention; Smartphone app;

Representative publications from supervisors:

1: Donoghue K, Patton R, Phillips T, Deluca P & Drummond C. 2014. The effectiveness of electronic Screening and Brief Intervention (eSBI) for reducing levels of alcohol consumption. A Systematic review and meta-analysis. *Journal of Internet Medical Research*, 16(6):e142. DOI:10.2196/jmir.3193

2: Patton R, Deluca P, Phillips T, Kaner E, Newbury-Birch D & Drummond C. 2014. Alcohol screening & brief intervention for adolescents: The how, what and where of reducing alcohol consumption and related harm among young people. *Alcohol & Alcoholism* 49(2): 207-212 DOI: 10.1093/alcalc/agt165doi: 10.1093/alcalc/agt165

LSUH-2.08 Maintaining abstinence from smoking after a period of enforced abstinence

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Second Supervisor: Dr Leonie Brose

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Project Description

People with mental health problems and those in prisons are two populations whose health quality of life and life expectancy is disproportionately affected by smoking

As mental health hospitals are going smoke-free, evidence shows that most patients return to smoking very quickly after discharge, presenting a missed opportunity to reduce health inequalities.

We have systematically reviewed interventions aiming to maintain abstinence and are developing a study to test the feasibility of an intervention within a mental health setting.

Prisons are currently at a critical point in the policy debate around going smoke-free and there is even less evidence about the effects of the enforced behaviour change in smoking in the prison population or about interventions that may support maintaining abstinence after discharge.

Building on our work in mental health and using existing departmental collaborations with prisons, this project will extend the research and include a cohort study of former smokers discharged from in-patient care or prison to assess transitions in behaviour and explore factors associated with maintenance of abstinence. In collaboration with staff and patients/inmates in the respective populations, the project will then develop and test the feasibility of delivering an intervention and following up both cohorts after discharge/release, to assess what support is required and how it should be delivered with a view to later testing the effectiveness of interventions.

Skills training: Literature reviews, stakeholder engagement, interdisciplinary teamwork, quantitative and qualitative data collection and analysis, intervention development, publishing research.

Keywords: smoking; prisons; abstinence; inequalities; support;

Representative publications from supervisors:

1: MCNEILL, A., BROSE, L. S., CALDER, R. et al. (2015) E-cigarettes: an evidence update. A report commissioned by Public Health England (London, Crown Copyright).

2: TAYLOR, G., MCNEILL, A., GIRLING, A. et al. (2014) Change in mental health after smoking cessation: systematic review and meta-analysis, BMJ, 348, g1151.

LSUH-2.09 Exposure and Augmented Reality Therapy: A Novel Cognitive Therapy for Substance Dependence

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Project Description

Psychoactive substance use disorder are characterised by hard to resist urges which take the form of memories (with strong imaginal content, emotions, strong motivations and activated beliefs. To date, psychosocial interventions have not proved effective at helping people with substance use disorders attain cognitive control and developing effective therapies is a high priority. This project capitalises on the successful completion of a pilot randomised controlled trial of a novel cognitive therapy conducted by a team led by Professor John Marsden at South London and Maudsley NHS Foundation Trust and the Clinical Research Facility at King's College Hospital. This therapy uses cognitive restructuring and craving memory reconsolidation techniques alongside drug conditioned cue exposure procedures. Advances technology offers a unique opportunity to apply the recently developed cognitive therapy with an adjunctive augmented reality therapy (ART). The ART application will enable people with substance use disorders to experience and manipulate drug cue conditioned environments under experimental conditions to facilitate cognitive control. The PhD will be based in a team engaged in definitive three-group RCT of this cognitive therapy (assessment and exposure, versus cognitive therapy and cognitive therapy plus ART) and will focus on determining mechanisms of cognitive and behavioural change. This project has high translational potential for delivery in the NHS.

Objectives for the PhD are as follows: **Year 1** - research governance, completion of ART environment and trial procedures; **Year 2** - completion of fieldwork for the three-group RCT of cognitive therapy with adjunctive ART; **Year 3** - Project analysis, and write-up.

Keywords: Cognitive therapy; Cue Exposure; Augmented Reality Therapy; Substance Use; Disorder; Cocaine;

Representative publications from supervisors:

1: Marsden, J et al. Development of the Addiction Dimensions for Assessment and Personalised Treatment (ADAPT). Drug and Alcohol Dependence 2015

2: Marsden, J et al. Cognitive Therapy for Substance Dependence: Protocol for randomised controlled trial. Contemporary Clinical Trials. 2016

LSUH-2.10 Transitions to less harmful ways of consuming nicotine among intransigent smokers

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Second Supervisor: Professor Ann McNeill

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Project Description

Smoking remains the most important risk factor for premature morbidity and mortality. While many smokers attempt to stop, others are not motivated to stop smoking either because they are unable to stop or unwilling to do so.

Transition to less harmful ways of consuming nicotine (e.g nicotine replacement, e-cigarettes) would improve health but there is little evidence on how best to encourage transitioning away from combustible nicotine use to less harmful forms of nicotine delivery.

To date, there is also limited evidence on what effects use of different nicotine-containing products (alongside smoking, as in dual use, or as a smoking substitute) may have on smoking cessation and relapse to smoking in this population.

We have been running a longitudinal survey of smokers and ex-smokers since 2012 and these data will be used to analyse trajectories and transitions between smoking, dual use with other nicotine-containing products, smoking abstinence and relapse.

Building on other research in relapse prevention a small-scale study will be carried out among smokers not motivated to quit but willing to try other nicotine delivery devices. This is anticipated to involve the use of ecological momentary assessment devices which allow the participant to report on symptoms, affect and behaviour close in time to experience. This will provide more accurate information about how these are linked with transitions in smoking and nicotine use.

This research will inform new interventions to support non-motivated smokers and guidance.

Skills training: complex data analysis, publishing research, critical appraisal, intervention development, systematic reviews, participant engagement.

Keywords: smoking; harm reduction; nicotine; e-cigarettes;

Representative publications from supervisors:

1: MCNEILL, A., BROSE, L. S., CALDER, R. et al. (2015) E-cigarettes: an evidence update. A report commissioned by Public Health England (London, Crown Copyright).

2: BRITTON, J. & MCNEILL, A. (2013) Nicotine regulation and tobacco harm reduction in the UK, Lancet, 381, 1879-80.