

Table of Contents

Welcome Message from the Chair, Research Committee	9
Programme of Events	11
Guest Speaker Profiles	15
Prof. Andrey Shkoporov.....	15
Prof. Cairiona O’Driscoll	15
Dr. Piotr Kowalski	15
Prof Jonathan Drennan	16
Prof. Deirdre Murray	17
Oral Presentation Abstracts	18
Session 1: The molecules of life	18
10-minute talks	18
Exposure to maternal pre-eclampsia serum increases neurite growth and mitochondrial function through an IL-6-dependent mechanism in an in vitro model of neurodevelopment.....	18
Design, Build and Test of novel bacteria-delivered proteins for cancer therapy.....	19
Base editing rescues G542X CFTR mutation. Lucia Nicosia. CF Gene Editing Lab, Department of Physiology.....	19
Elevator pitch talks	20
Assessment of functional outcomes and inflammatory markers in patients with Functional Movement Disorders receiving a physiotherapy intervention as part of a multidisciplinary approach to recovery.....	20
Drug loaded-microneedle systems for the treatment of allergic conditions in children: preformulation and formulation studies.....	21
Bovine Immune phagome	22
Developing novel ionizable amino-polyesters for cell-type selective mRNA delivery.....	23
Delivery of Tie2 mRNA to the endothelium as a novel strategy for the treatment of sepsis-induced multiple organ failure.....	23
Session 2: from molecules to medicines	24
10-minutes talks	24
An IBD-associated pathobiont collaborates with NSAID to promote inflammation and cell death in the susceptible host via the caspase-8/NLRP3axis.....	24
When benefits outweigh the risks: The First case of Triple Therapy CFTR modulation (Kaftrio™) in a solid organ liver transplant recipient in Ireland.....	25
Defining the Therapeutic Potential of Class Specific Histone Deacetylase Inhibitors in an In Vitro Neuroinflammation Model of Parkinson’s Disease.....	27
Elevator pitch talks	27

Catching the Silent Killer: Can Long Non-Coding RNAs Diagnose and Classify Ovarian Cancer?	27
Presence of CT-Evaluable Abnormal Body Composition Phenotypes is Associated with Poor Survival in Ambulatory Cancer Patients Receiving Systemic Therapy in Ireland (SARCONC Study).	28
Investigating the peri-operative trend of inflammatory mediators in breast cancer and association between differential inflammatory mediators and tumour characteristics.....	29
Tailoring strategies to support the implementation of Dose Adjustment For Normal Eating (DAFNE), a structured patient education programme for people with Type 1 diabetes.....	30
Trait schizotypy and motivation for cannabis use and cessation: a cross-sectional study.....	31
Session 3: People centric research.	32
10-minutes talks	32
UniCoV-UCC – Surveillance and detection of SARS-CoV-2 on the UCC campus during the 2021-2022 Teaching year - Apps, antigens, saliva, wastewater and participation.....	32
“Short stops” and “footnotes”: End-of-life care and the recently qualified doctor. Catherine Sweeney. Medical Educational Unit.....	33
Fatal Fetal Anomaly: Exploring experiences of women and their partners.....	33
Elevator pitch talks	35
Complementary and Alternative Medicine: Determining the use of biologically based practices among Irish cancer survivors.....	35
Pregnancy Outcomes Following Recurrent First Trimester Miscarriage: A Retrospective Cohort Study.....	35
What Do Older Adults And Health Care Professionals Look For In A Food Product?	36
TeCC (TeleHealth, Cystic Fibrosis, Corona-Virus) Study in a previous telehealth-naive-centre; Clinical challenges, outcomes, and user experience in the first six months of a global pandemic.	37
Congenital anomalies among early neonatal deaths and very low birthweight infants in Ireland: Maternal, fetal and care characteristics.....	38
Poster Presentation Abstracts	40
Online	40
5. Learning in the community: medical student’s experiences of training within a community paediatric clinic set in a low-income neighbourhood	40
6. eHealth Interventions to Support Self-Management in those with Musculoskeletal Disorders: ‘eHealth: It’s TIME’: A Scoping Review	40
8. How much is the lack of retention evidence costing trial teams in Ireland and the United Kingdom?	41
9. Patient perceptions of the challenges of recruitment to a renal randomised trial registry: a pilot questionnaire-based study.....	42
10. Involving stakeholders with professional and lived experience in the development of guideline-based care quality indicators: Insights from the RE:CURRENT Project	43
11. How we define recurrent miscarriage matters: Views of people with lived and/or professional experience.....	44

12. eHealth Interventions to Support Self-Management: Perceptions and experiences of People with Musculoskeletal Disorders and Physiotherapists - 'eHealth: It's TIME': A Qualitative Study	45
14. Trends in drug- and vaccine-based dissolvable microneedle materials and methods of fabrication	45
15. A national survey of women's experiences of recurrent miscarriage care	46
16. Exploring first time mothers' experiences and knowledge about behavioural risk factors for stillbirth	47
18. National Survey of women on the Irish Gestational Trophoblastic Disease Registry	47
19. Characteristics associated with perinatal mortality in multiple pregnancies.....	48
20. Investigation into AAV-BMP2 viral vector as a neurotrophic therapy for Parkinson's Disease	49
24. Oral Nutritional Supplements and Dental Health	49
26. The perceived effects of facemasks on communication in Irish healthcare settings and possible compensatory strategies to overcome these effects.....	50
28. Probiotic supplementation of <i>B. longum</i> PSY001 modulates hypothalamic and hippocampal gene expression regulating appetite and satiety	50
30. Estimating the direct Disability-Adjusted Life Years (DALYs) associated with SARS-CoV-2 (COVID-19) in the Republic of Ireland: The first full year	51
32. Improving the nutritional status of cancer patients: development of free patient resources	52
33. The daily life experiences of UCC doctoral students and how the "Everyday Matters: Healthy Habits for University Life" digital badge impacts daily life and well-being	53
34. Effects of gut microbiota depletion on anxiety-like behaviour and expression of synaptic proteins in rodent models.....	53
36. Structural changes and inflammation in the myocardium of a porcine model of metabolic syndrome with HFpEF.....	54
38. Pursuing People-Centric Research with Family Carers of Dementia through PPI & Research Design	54
39. Oral care for inpatients with dysphagia post stroke; exploring barriers and facilitators	55
44. Practice implications from a systematic review on perinatal maternal mental health during COVID-19 lockdowns.....	56
47. The Effectiveness of a 26-week Class and Home-based OTAGO Exercise Programme on Self-Reported Balance Confidence and Physical Performance in Older Adults in Ireland.....	57
48. An Evaluation of patient experience of virtual telephone consultation for routine diabetes care during COVID-19 and future clinic preference.....	57
49. A Systematic Review and Future Research Agenda: Adolescents' Autonomy Transition to Self-Management of Type 1 Diabetes	58
50. Understanding participation in a new online National Diabetes Prevention Programme in Ireland: a mixed methods study with collaboration from academic, clinical and public contributor	59
51. Exploring Sexual Health Interventions for Women with Breast Cancer: Irish Healthcare Professionals Perspectives.....	59

54. A qualitative evidence synthesis of parental experiences and perceptions of parent-child interaction therapy (PCIT) for preschool children with communication difficulties	60
59. A multi-national survey of learning needs in healthy and active ageing as rated by potential students, employers, academics and key stakeholders	61
61. Bringing Therapy Home: Exploring parents' experiences of telehealth for children with Developmental Coordination Disorder	61
63. Behaviour change interventions for physical activity in adults with chronic obstructive pulmonary disease (COPD); protocol for a systematic review	62
65. Survival and morbidity of Very Low Birth Weight Infants in Ireland: 2015-2019.....	63
66. Living with Endometriosis: A qualitative exploration of women's perceptions and experiences of diagnosis, supports and treatment options in Ireland.....	64
68. Practice Enhancement for Exclusive Breastfeeding (PEEB): Women and Partners' Self-Reported Breastfeeding Attitudes and Self-efficacy	64
69. Podiatrists' experience of implementing a National Model of Care for The Diabetic Foot	65
71. The "How" of conducting impactful Virtual Focus Groups during a pandemic	66
73. In silico assembled Non-human primate bacteriophage genomes: Real or Unreal?.....	66
76. The small molecule class IIa HDAC inhibitor TMP269 protects against degeneration in in vitro models of Parkinson's Disease.....	67
80. A Bioinformatics Approach Highlights the Potential of Retinoids in Glioblastoma Growth Regulation.....	68
81. Functional analysis reveals ZNHIT1 as a promoter of BMP-Smad signaling and a novel target for neuroprotection against alpha-synuclein-induced impairments in Parkinson's disease.	68
82. Retrospective review of bone health status, management and treatment of low bone mineral density of the Cystic Fibrosis adult population attending Cork University Hospital	69
83. Impact of CFTR triple combination modulator therapy (Kaftrio) on body composition in adults with Cystic Fibrosis	70
84. Individualized approach to elexacaftor/ tezacaftor/ ivacaftor dosing in cystic fibrosis.	70
87. Influence of Antibiotic Chemistry on Paediatric Patient Acceptability.....	71
89. A study on the co-design of a Speech and Language Therapy app for Individuals with Parkinson's disease.....	72
93. Delivery of antisense oligonucleotide using cyclodextrin-based nanoparticles: an effective Huntingtin lowering approach.....	72
94. Mitochondrial dysfunction drives a dysregulated inflammatory response in gestational diabetes mellitus.....	73
98. Understanding the implementation of a befriending service to support the needs of isolated vulnerable adults in the community: A rapid analysis.....	75
101. What is the knowledge of Care Staff and the use of hearing aids in Irish Nursing Homes?.....	75
105. Are Platelet-Rich Plasma Injections Effective in the Management of Lower Limb Tendinopathies? A Systematic Review	76

107. Antibody profiling to SARS-CoV-2 in healthcare workers following wave 1 of the COVID-19 Pandemic- decline, persistence and neutralisation	77
111. Experiences of Religiously Observant Muslim Women as Users of Irish Healthcare Services: A Qualitative Study of Barriers, Facilitators and Recommendations for Improvements	77
113. Masking our Communication: Effects of Clear and Surgical Face Coverings on Communication ..	78
114. Masking our Communication: The Effects of Face Coverings on the Perception of Facial Expressions	79
116. The impact of short-term microbiota depletion on hippocampal electrophysiology in mice.....	80
120. Targeting two CF-causing mutations with a single pegRNA by PRIME editing	80
122. Rationalising Counterion Selection for Development of Lipophilic Salts to Eliminate Variable Food Effect: Case Study with Venetoclax	81
131. The effectiveness of Social Prescribing interventions in the management of long-term conditions in community-based adults: A systematic review and meta-analysis.....	81
133. The National Perinatal Epidemiology Centre.....	82
134. Evaluating dementia palliative care services across Ireland and the UK using the RE-AIM framework	83
135. The Unmet Needs of Patients Living With Metastatic Breast Cancer: A Literature Review.....	84
140. Hypertensive disorders of pregnancy and long-term risk of maternal stroke – A systematic review and meta-analysis	84
141. Evaluating the Self-harm Assessment and Management for General Hospitals (SAMAGH) Training Programme: Findings from a Focus Group Study	85
142. Secondary bile acids suppressed colonic secretion of the pro-inflammatory cytokine, interleukin-6 in Sprague Dawley rats	86
143. Sex-Dependent Effects of Early-Life Microbiota Depletion on Behaviour, Neuroimmune Function and Neuronal Development	88
145. Development of a Bioassay to Detect Inhibition of Intervention in Bacterial Microcompartment Shell Protein Crosslinking	88
146. Microbial-Derived Metabolites Induce Actin Cytoskeletal Rearrangement and Protect Blood-Brain Barrier Function.....	89
147. Identifying the challenges for deaf patients during medical imaging	89
Posters Presented In-person	91
4. Peripheral administration of the Class-IIa HDAC inhibitor MC1568 partially protects against nigrostriatal degeneration in the striatal 6-OHDA rat model of Parkinson’s disease.....	91
17. Severe maternal morbidity and critical care requirements in pregnancy in Ireland.....	91
22. A review of central nervous system lymphomas (CNSL) diagnosed at a single tertiary referral neuroscience centre.....	92
23. The Prevalence of Dental Caries in adults with Cystic Fibrosis.	92

25. General practitioners' perceptions of pharmacists working in general practice: a qualitative interview study.....	93
31. Beliefs and awareness of common cancer risk factors among Irish males.....	94
35. Rituximab – Patient Management and Outcomes in the Covid-19 era.....	94
37. Medication Challenges in the Post-Stroke Patient: A Qualitative Study.....	96
40. The Effects of Perturbation-Based Training on Falls and Kinematic Data in an Older Adult Population: A Systematic Review.....	96
41. Can behavioural change interventions improve self-efficacy and exercise adherence among people with Parkinson's? A systematic review.....	97
43. Regulated Intramembrane Proteolysis of ACE2: A Proposed Role of Host Factor Cleavage in SARS-CoV-2 Syncytiation.....	98
46. Understanding implementation of self-management support in cancer services: a multiple case study of the factors influencing implementation.....	98
52. The Contribution of Audio-Visual Integration to the Recall of Medical Instructions.....	99
58. Gastrointestinal Motility in the Very Preterm Infant and its Implications for Clinical Care.....	100
62. Does Lyso-Gb3 play a causal role in gastrointestinal symptomology in Fabry disease?.....	100
64. Maternal morbidity and mortality: an iceberg phenomenon.....	101
67. Implementation of an ISO15189 accredited Next Generation Sequencing service with the Ion Torrent Genexus: The experience of a clinical diagnostic laboratory.....	102
70. Do Menopausal Symptoms Impact Occupations/ADLs For Women In Ireland?.....	103
72. Association of preoperative and postoperative circulating tumour DNA (ctDNA) with PIK3CA gene mutation with risk of recurrence in patients with non-metastatic breast cancer.....	103
75. The Role of the Nurse in Patient Focused Research during COVID-19- How in putting patient needs first, this study was completed.....	104
88. An Investigation into the Impact of Dietary Additives on Epithelial Cell Responses and Inflammation.....	104
90. Development of a flow-cytometry-based platform for multiparametric analysis of systemic immune-metabolic dysregulations of pregnancy.....	105
92. Developing in vitro lipolysis model for real-time analysis of drug concentrations during digestion of lipid-based formulations.....	106
95. The association between self-reported sensory function (vision and hearing) and cognitive function. Results from the Irish Longitudinal Study on Aging (TILDA).....	106
102. LYSA Trial - The Dietetic Intervention Component for a Women Cancer Survivorship Pilot Clinic.....	107
103. Potential alcohol use disorder among MSM in Ireland - Findings from the European MSM internet survey (EMIS 2017).....	108
112. Nebulization of siRNA-containing lipid-based delivery vectors produced by microfluidic mixing.....	109

115. Implementing voluntary or mandatory food marketing codes in European countries to protect children and adolescents' health and rights: process and challenges.....	110
117. Effects of prebiotics on post-partum stress resilience: Implications for post-partum depression and anxiety disorders.	110
118. Evaluating diagnostic approaches to cachexia in a dietitian-led multimodal cancer cachexia intervention in metastatic cancer (CACHEXIA-CARE).	111
128. Interleukin (IL)-6 impairs progenitor cell proliferation and alters subsequent neuronal and glial differentiation during cortical neural stem cell development in vitro.	111
129. Film coated colonic drug delivery systems for site specific delivery: in vitro assessment of drug release.....	112
136. Microbiome profiling for the stratification of cancer patients	113
137. How blogs support the transfer of knowledge into practice in the field of dementia palliative care: a survey of facilitators and barriers	113
138. The Immune Profile of the Microbiome, an exploration the small and large bowel.....	114
139. Sialic Acid-Targeted Cyclodextrin-Based Nanoparticles for siRNA Delivery to Reprogram Tumour-Associated Macrophages in Prostate Cancer in vitro	114
148. The development and implementation of a real-time suicide surveillance system in South-West Ireland.....	115
Appendix	i

College of Medicine and Health Research Conference

“from Molecules to People”

Welcome Message from the Chair, Research Committee,
College of Medicine and Health, UCC

Dear Friends and Colleagues,

On behalf of Professor Helen Whelton, Head of the College of Medicine and Health, and the College’s Research Committee, it is with great pleasure that I welcome you all to our Inaugural “from Molecules to People” Research Conference.

This Conference will showcase the diverse range of research projects completed across our six Schools and the research centres within the College. The Conference will enable students and staff to discuss the latest research, with contributions from researchers from all levels, undergraduate and postgraduate, at the forefront of developments in their areas.

The programme includes a stimulating mixture of oral and poster presentations (online and in-person), in addition to plenary lectures by prominent research staff from within the College and from our affiliated hospitals.

The plenary speakers will discuss their research on the gut microbiome, RNA nanotherapeutics, health and wellbeing in the workplace and brain function in children.

The meeting presents an exceptional opportunity to boost research networks and enhance the research environment across the University. We hope all of today’s participants - students, staff and guests - enjoy the conference programme, as well as the hospitality provided by the College of Medicine and Health during the event.

I would personally like to extend my deep gratitude to Ashleigh Byrne, Caroline Seacy, Conference UCC, the Research Committee of the College of Medicine and Health*, the sessional Chairs* and presentation judges* whose immense contribution and support have assured the professional delivery of our “from Molecules to People” Research Conference. Sincere thanks also to the College of Medicine and Health, and the HRB Clinical Research Facility UCC, who kindly sponsored the prizes.

Yours faithfully,

A handwritten signature in black ink that reads "Liam J. Fanning". The signature is written in a cursive style with a large initial 'L'.

Liam J. Fanning, PhD, DSc, FHEA
Professor, Immunovirology
Chair, Research Committee, College of Medicine and Health, UCC.

And

A handwritten signature in blue ink that reads "Helen Whelton". The signature is written in a cursive style with a large initial 'H'.

Prof Helen Whelton,
Head, College of Medicine and Health, UCC
Chief Academic Advisor to the HSE SSWHG

*See Appendix A

Programme of Events

Opening 9:00-9.15am

Professor Liam Fanning. Launch inaugural "from Molecules to People" conference

Professor John Cryan, VPRI, UCC. UCC's research ecosystem

09.20-11.00: Session 1: The molecules of life

Co-chairs: Dr John MacSharry and Dr Irina Korotchikova

09.20-09.45: Invited talk by Prof. Andrey Shkoporov, APC Microbiome.
"The viral dark matter of the gut microbiome".

09.45-10:24: 10-minute talks with 3 minutes for questions

- Exposure to maternal pre-eclampsia serum increases neurite growth and mitochondrial function through an IL-6-dependent mechanism in an in vitro model of neurodevelopment. Aaron Barron. Department of Anatomy & Neuroscience.
- Design, Build and Test of novel bacteria-delivered proteins for cancer therapy. Yensi Flores Bueso. CancerResearch@UCC.
- Base editing rescues G542X CFTR mutation. Lucia Nicosia. CF Gene Editing Lab, Department of Physiology.

10:25-11:00: Elevator pitch style 3-minute talks. 1 question.

- Assessment of functional outcomes and inflammatory markers in patients with Functional Movement Disorders receiving a physiotherapy intervention as part of a multidisciplinary approach to recovery. Kieran Doherty. Department of Psychiatry & Neurobehavioural Science.
- Drug loaded-microneedle systems for the treatment of allergic conditions in children: preformulation and formulation studies. Maja Railic. School of Pharmacy.
- Bovine Immune phagome. Aonghus Lavelle. Department of Medicine.

- Developing novel ionizable amino-polyesters for cell-type selective mRNA delivery. Aida López Espinar. School of Pharmacy.
- Delivery of Tie2 mRNA to the endothelium as a novel strategy for the treatment of sepsis-induced multiple organ failure. Lianne Mulder. School of Pharmacy.

11.00-11.30am: Coffee Break/Poster Viewing in-person and online

11.30-13.25: Session 2: From molecules to medicines

Co-chairs: Dr Gabriella Rizzo and Dr Asma Amamou

11.30-11.55: Invited talk by Prof. Caitriona O'Driscoll, School of Pharmacy.
"Non-invasive delivery of RNA medicines of the future".

11:55-12:34: 10-minute talks per talks with 3 minutes for questions

- An IBD-associated pathobiont collaborates with NSAID to promote inflammation and cell death in the susceptible host via the caspase-8/NLRP3axis. Raminder Singh. APC Microbiome Ireland.
- When benefits outweigh the risks: The First case of Triple Therapy CFTRmodulation (Kaftrio™) in a solid organ liver transplant recipient in Ireland. Hisham Ibrahim. Cork Adult CF Centre. CUH.
- Defining the Therapeutic Potential of Class Specific Histone Deacetylase Inhibitors in an In Vitro Neuroinflammation Model of Parkinson's Disease. Natalie Krakoski. Department of Anatomy & Neuroscience.

12:35-13:00: Elevator pitch style 3-minute talks. 1 question.

- Catching the Silent Killer: Can Long Non-Coding RNAs Diagnose and Classify Ovarian Cancer? Aideen McCabe. School of Biochemistry.
- Presence of CT-Evaluable Abnormal Body Composition Phenotypes is Associated with Poor Survival in Ambulatory Cancer Patients Receiving Systemic Therapy in Ireland (SARCONC Study). Erin Stella Sullivan. School of Food and Nutritional Sciences.

- Investigating the peri-operative trend of inflammatory mediators in breast cancer and association between differential inflammatory mediators and tumour characteristics. Carolyn Cullinane. Department of Academic Surgery.
- Tailoring strategies to support the implementation of Dose Adjustment For Normal Eating (DAFNE), a structured patient education programme for people with Type 1 diabetes. Fiona Riordan. School of Public Health.
- Trait schizotypy and motivation for cannabis use and cessation: a cross-sectional study. Colm O'Tuathaigh. Medical Educational Unit.

13:00-13:25: Invited talk by Dr. Piotr Kowalski, School of Pharmacy.
"Engineering messenger RNA nanotherapeutics".

13.25-14.15: Luncheon Break/Poster Session in-person and online

14.15-16.20: Session 3: People centric research

Co-chairs: Professor Nicole Muller and Ms. Shauna Bell

14.15-14.40: Invited talk by Prof. Jonathan Drennan, School of Nursing and Midwifery.
"Magnet4Europe - Improving Health and Wellbeing in the Health Care Workplace".

14:40-15:20: 10-minute talks with 5 minutes for questions

- UniCoV-UCC – Surveillance and detection of SARS-CoV-2 on the UCC campus during the 2021-2022 Teaching year - Apps, antigens, saliva, wastewater and participation. John MacSharry, School of Medicine.
- "Short stops" and "footnotes": End-of-life care and the recently qualified doctor. Catherine Sweeney, Medical Educational Unit.
- Fatal Fetal Anomaly: Exploring experiences of women and their partners. Peter Jackson, Pregnancy Loss Research Group, Cork University Maternity Hospital

15:20-15:45: Elevator pitch style 3-minute talks

- Complementary and Alternative Medicine: Determining the use of biologically based practices among Irish cancer survivors. Clodagh Scannell, CancerResearch@UCC.

- Pregnancy Outcomes Following Recurrent First Trimester Miscarriage: A Retrospective Cohort Study. Laura Linehan, INFANT Centre & Department of Obstetrics & Gynaecology.
- What Do Older Adults And Health Care Professionals Look For In A Food Product? Lauren O'Mahony, Centre for Gerontology and Rehabilitation.
- TeCC (TeleHealth, Cystic Fibrosis, Corona-Virus) Study in a previous telehealth-naive-centre; Clinical challenges, outcomes, and user experience in the first six months of a global pandemic. Tamara Vagg, Cork Adult CF Centre, CUH.
- Congenital anomalies among early neonatal deaths and very low birthweight infants in Ireland: Maternal, fetal and care characteristics. Jane Peters, National Perinatal Epidemiology Centre.

15:45-16:10: Invited talk by Prof. Deirdre Murray, INFANT Centre.

"Predicting early brain function in high-risk children and why it matters."

16:10-16.20: Prize announcements and close of conference, Professor Liam J Fanning

Guest Speaker Profiles

Prof. Andrey Shkoporov

Professor Andrey Shkoporov is a molecular microbiologist with special interest in the human gut phageome, microbiome, gut anaerobes, and beneficial microbes. He transitioned to a career in microbiology after obtaining a medical degree from Russian State Medical University.

He also obtained a PhD in microbiology from the same university in 2009 and worked in Russia as a post- doctoral researcher on several projects. In 2015, he joined APC as a research fellow to work on the Gut Phageomics Spoke focusing on the role of human gut phageome in IBD.

In 2020 he was awarded a Wellcome Trust Career Development Fellowship and an ERC Consolidator Grant to continue his research of bacteriophage communities in the human gut.

Prof. Caitriona O'Driscoll

Caitriona M. O'Driscoll is Professor and Chair of Pharmaceutics in the School of Pharmacy, University College Cork, Ireland. Originally a Pharmacist, she completed her PhD in Pharmaceutical Sciences at Trinity College Dublin and was Senior Lecturer there until 2003.

Her research interests are translational in nature and include oral and parenteral delivery of nano-therapeutics incorporating nucleic acids, formulated using novel biomaterials. Manufacturing hurdles and new tools to efficiently assess and facilitate licencing of these innovative therapies are also of interest.

She is the coordinator of GENEGUT, entitled 'Oral delivery of encapsulated RNA nanotherapeutics for targeted treatment of ileal Crohn's disease', funded by the European Commission under the HORIZON-HLTH-2021-TOOL-06 Programme Grant Agreement number 101057491.

Dr. Piotr Kowalski

Dr. Kowalski is an Associate Professor in advanced therapies at the School of Pharmacy, University College Cork, and a Funded Investigator at the APC Microbiome Ireland. He earned his Ph.D. in 2014 from the University of Groningen (the Netherlands) which focused on the development of lipid-based systems for tissue selective delivery of siRNA.

He received his postdoctoral training at the Koch Institute for Integrative Cancer Research at the Massachusetts Institute of Technology in the laboratories of Prof. Daniel Anderson and Prof. Robert Langer. His multidisciplinary research focused on engineering novel biomaterials

to enable the delivery of messenger RNAs to treat inflammatory diseases, cancer, and diabetes.

Dr. Kowalski's work resulted in a number of high-impact publications, several patents on RNA delivery technologies, and the creation of a US-based biotech startup (Orna therapeutics). His research at UCC is centered on developing Advanced Therapy Medicinal Products, in particular, novel clinically relevant drug delivery technologies for parental and non-parental applications, to facilitate effective nucleic acid-based therapies aimed at high medical need diseases that lack effective treatment.

Dr. Kowalski has recently won a prestigious European Research Council Starting grant to develop a new class of circular RNA therapeutics. Currently, his group investigates the therapeutic potential of RNA molecules, including short interfering RNAs, messenger RNAs, and circular RNAs to treat diseases such as sepsis, inflammatory bowel disease, and cancer by delivering these RNAs to diseased cells

Prof Jonathan Drennan

Professor Jonathan Drennan holds the Chair of Nursing and Health Services Research at the School of Nursing and Midwifery, University College Cork. He was previously Professor of Healthcare Research at the University of Southampton.

Professor Drennan has undertaken research in Ireland and the UK on nurse and midwife prescribing, cancer information services, research priorities for nursing and midwifery, safe nurse staffing and advanced practice.

He presented to and advised the National Institute for Health and Care Excellence (NICE) Safe Staffing Advisory Committees on staffing in medical and surgical wards and accident and emergency departments in the UK. This was part of the development process of the NICE guidelines on safe staffing.

Professor Drennan is currently a member of the Department of Health taskforce involved in the development of guidelines for safe nurse staffing and skill mix in the healthcare sector. He is currently leading a Health Research Board and Department of Health funded study on safe staffing in medical, surgical, emergency and older person's settings in Ireland. Professor Drennan is also part of a European and US research team that have been awarded €4 million from the EU Horizon 2020 research programme. The title of the research, Magnet4Europe, develops and implements a theory-based organizational redesign in 60 hospitals in 5 European countries and involves one-to-one twinning between hospitals in Europe and Magnet hospitals in the US with the aim of improving the health and wellbeing of healthcare staff and enhancing the working environment.

Prof. Deirdre Murray

Prof Deirdre Murray is a Prof of Paediatrics and Consultant Paediatrician in the Department of Paediatrics and Child Health, University College Cork. Prof. Murray trained in General Paediatrics in Dublin before completing a Specialist Registrar Training and Fellowship training in Paediatric Intensive Care Medicine in the Bristol Royal Children's Hospital, Bristol and the Royal Children's Hospital, Melbourne.

Prof Murray then returned to Ireland to take up a dedicated Research Fellowship in UCC and complete her PhD in the area of neonatal hypoxic ischaemic encephalopathy, supported by the Denis O'Sullivan Research Fellowship award. Prof Murray has a strong research background in newborn brain injury and developmental assessment. She is a founding member of the Neonatal Brain Research Group (www.nbrg.ucc.ie) and a principal investigator of the INFANT (Irish Centre for Maternal and Child Health Research (www.infantcentre.ie)). She is the principal investigator of the Cork BASELINE Birth Cohort Study and the BiHiVE study.

Through large international studies she has been working to develop new ways to predict new-born brain injury using continuous multi-channel EEG, blood-based biomarkers and early neurological assessment. In 2012 she was awarded a Health Research Board Clinician Scientist Award to study early blood-based biomarkers in hypoxic-ischaemic encephalopathy, the BiHiVE2 study (www.medscinet.net/bihive).

She is the principal investigator of the Cork BASELINE Birth Cohort study (www.baselinestudy.net) which is a collaborative birth cohort study examining early environmental influences of neurocognitive and behavioral outcome. In response to the growing evidence of long-term learning difficulties in HIE, Prof Murray is now working to develop new methods of early cognitive assessment using touchscreen technology in the Science Foundation Ireland funded Beyond BiHiVE project.

Oral Presentation Abstracts

Session 1: The molecules of life. Co-Chairs: Dr John McSharry and Dr Irina Korotchikova

10-minute talks

Exposure to maternal pre-eclampsia serum increases neurite growth and mitochondrial function through an IL-6-dependent mechanism in an in vitro model of neurodevelopment.

Barron A¹, McCarthy C², O'Keeffe G¹

¹*Department of Anatomy and Neuroscience, University College Cork, ²Department of Pharmacology and Therapeutics, University College Cork*

Introduction: Prenatal exposure to the common hypertensive disorder of pregnancy, pre-eclampsia (PE), increases the risk of neurodevelopmental disorders in exposed offspring. However, the cellular and molecular basis of this increased risk are currently unknown.

Objective: To determine the effects of exposure to maternal serum from women with PE on an in vitro model of neurodevelopment, and investigate potential molecular mechanisms involved.

Methods: Human neuroblastoma SH-SY5Y cells were neuronally-differentiated with retinoic acid and brain-derived neurotrophic factor. We examined the effects of maternal serum from women with PE or a healthy uncomplicated pregnancy on the survival, neurite growth and mitochondrial function of differentiated SH-SY5Y cells. Following this, we investigated the pleiotropic cytokine IL-6 as a potential mechanism of any observed effects.

Results: Cells exposed to PE serum exhibited increased neurite growth and mitochondrial respiration, two important neurodevelopmental parameters, compared to those treated with control serum (n=10-13, p < 0.05). Levels of IL-6 were significantly elevated in maternal PE sera and placental explant supernatants (n=4-5, p < 0.05), and in agreement with this, cells exposed to PE serum had increased phospho-STAT3, a key intracellular mediator of IL-6 signalling (n=4, p < 0.05). Furthermore, neutralizing IL-6 with a function-blocking antibody prevented the effects of PE serum on neurite growth (n=5, p < 0.05), whereas exposure to IL-6 induced a similar phenotype to PE serum.

Conclusions: Collectively these data show that PE results in elevated serum levels of maternal IL-6, which mediates an increase in neurite growth and mitochondrial function in differentiated SH-SY5Y cells.

Design, Build and Test of novel bacteria-delivered proteins for cancer therapy.

Flores Bueso Y^{1,2,3,5}, Baker D⁵, Bhardwaj G⁵, Tangney M^{1,2,3,4}

¹*CancerResearch@UCC*, ²*SynBio Centre, UCC*, ³*APC Microbiome Ireland*, ⁴*School of Pharmacy, UCC*, ⁵*Institute for Protein Design, University of Washington*

Conventional cancer therapies have many limitations that could potentially be overcome using engineered tumour targeting bacteria as cancer therapeutics. These bacteria have been shown to selectively grow in tumours where they can produce and deliver therapeutic biomolecules (proteins) extracellularly in the tumour microenvironment. However, the delivery of these biomolecules into the cytoplasm of targeted tumour cells remains a challenge, limiting the clinical translation of these therapies.

This project will address delivery challenges by designing multi-part, multifunctional proteins that transport themselves from the interior of the bacterium into the cytoplasm of cancer cells where they can exert therapeutic action. These proteins will integrate protein motifs for transport (using novel cell penetrating peptides) and anticancer activity. The viability of each of protein motif has been demonstrated in vitro. These motifs will be assembled using recently developed computational protein design workflows and a modular design-build-test synthetic biology approach, which will facilitate measurability and experimental throughput. The resulting novel proteins will be tested in vitro and in vivo with high-throughput methods available at host labs (e.g., LC-MS, CD Spectroscopy, FACS, x-ray crystallography and NMR).

This interdisciplinary approach is enabled by leveraging cutting-edge expertise and technologies in computational protein design from the Bhardwaj and Baker Lab at the Institute for Protein Design, UW (USA) and in bacterial cancer therapy available at the Tangney Lab, UCC (Ireland). This collaborative work was enabled by a Marie Skłodowska-Curie Actions - Global Individual Postdoctoral Fellowship (Awarded in 2022).

Base editing rescues G542X CFTR mutation. Lucia Nicosia. CF Gene Editing Lab, Department of Physiology

Nicosia L¹, Cavusoglu-Doran K¹, Harrison P¹

¹*University College Cork*

Cystic fibrosis (CF) is a life-shortening autosomal recessive monogenic disease, caused by loss-of-function mutations in the cystic fibrosis transmembrane conductance regulator (CFTR). G542X is the second most common CF-causing mutation. It is a single nucleotide change in CFTR, which generates a premature termination codon (PTC) that results in

nonsense-mediated decay (NMD) of the mRNA. The overall result is almost no CFTR protein expression, which makes G542X non targetable by current modulator therapies. Here, we describe a base-editing approach to correct G542X and make it druggable. At the DNA level, the G542X mutation is c.1624G >T, so our design strategy is to target the A on the non-coding strand and use adenine base editing (ABE) to edit this into G, thus converting the TGA (stop) codon to CGA (Arg).

CRISPR-Base editing of G542X was assessed in an established CF cell model, transfected with an adenine base editor (ABE8e-NG) and a specific guideRNA. Editing efficiency was measured by Sanger sequencing and analysed with EDIT-R software. Western Blot and functional assays will follow to evaluate CFTR transcript and protein function restoration.

Our current editing strategy corrects the stop codon in 17% of transfected cells but does not restore the WT amino acid, though it should still recover partial CFTR function. Future studies will focus on optimising base editing in CF cell models and primary cell lines, measure the level of CFTR functional rescue and test the synergistic effects of modulators on G542R.

Elevator pitch talks

Assessment of functional outcomes and inflammatory markers in patients with Functional Movement Disorders receiving a physiotherapy intervention as part of a multidisciplinary approach to recovery.

Doherty K^{1,2}, O'Sullivan L³, Gallagher S³, Crowley S^{1,2}, Moloney G^{4,5}, Kinahan J^{1,2}, Cassidy E^{1,2}, Clarke G^{4,5}, Cryan J^{4,5}, Campbell F³, Sweeney B⁶, Kelleher E^{1,2}

¹Department of Psychiatry & Neurobehavioural Science, University College Cork, ²Department of Liaison Psychiatry, Cork University Hospital, ³Department of Physiotherapy, Cork University Hospital, ⁴Department of Anatomy and Neuroscience, University College Cork, ⁵Alimentary Pharmabiotic Centre (APC) Microbiome Institute, University College Cork, ⁶Department of Neurology, Cork University Hospital

Objective: To measure functional change, mental-health outcomes and inflammatory markers in patients with functional movement disorder (FMD) pre and post a physiotherapy-delivered intervention as part of a multi-disciplinary team (MDT) approach to recovery.

Background: FMD occurs frequently in neurology services and leads to significant distress, disability, and healthcare costs. Possible underlying mechanisms include low grade systemic inflammation. There are limited outpatient MDT services for patients in Ireland.

Methods: Following diagnosis, patients received psychoeducation and were invited to participate in an individualised physiotherapy programme. Participants were assessed pre and post this intervention using validated tools; EQ 5D 5L Health Questionnaire, Workplace and Impairment Questionnaire, Short Form 36 Health Questionnaire and the Hospital Anxiety and Depression Scales (HADS). Serum and saliva samples were collected at each time point to analyse cortisol and inflammatory markers.

Results: 11 participants: 5 males and 6 females, median age 46 years completed the programme. 9 participants completed follow-up. Patients demonstrated improved outcomes at the completion of the programme as evidenced by significant improvements using the research measures ($p < 0.05$). There was no change in participants' salivary cortisol response. Alterations in inflammatory cytokines was suggested following the intervention e.g., IL-10, IL-4.

Conclusion: This successful pilot study demonstrates the feasibility of this intervention in an outpatient setting. Inflammatory cytokine changes following the intervention may suggest a role for inflammation in the mechanism of disease, although sample size was limited. This study provides support for further, larger scale research investigating the role of inflammation in FMD pathogenesis.

Drug loaded-microneedle systems for the treatment of allergic conditions in children: preformulation and formulation studies.

Railic M^{1,2}, Cronin B², Crean A^{1,2}, Vucen S^{1,2}

¹SSPC Centre for Pharmaceutical Research, ²School of Pharmacy, University College Cork

Drug delivery directly to the systemic circulation following topical application appears to be a desirable alternative to both oral and parenteral delivery. Dissolvable microneedles (DMNs) are patches which contain micro-sized arrays of needles that are strong enough to penetrate the skin, but also short enough not to reach pain receptors. They are fabricated using a material which dissolves in the contact with the skin releasing active pharmaceutical ingredient. These minimally invasive systems can be used in paediatric population to deliver drugs such as antihistamines which have low oral bioavailability and require fast onset of action.

This work focuses on preformulation studies investigating different concentrations of three polymers – namely polyvinylpyrrolidone/vinyl acetate (PVP/VA), hydroxypropyl methylcellulose (HPMC) and carboxymethyl cellulose (CMC), with regards to their capability of forming DMN patches. The characterisation methods included visual assessment of DMN structures by light microscopy and mechanical testing of DMN strength using a Texture Analyser® instrument.

Results revealed that aqueous solutions of 15% w/v PVP/VA, 10% w/v HPMC and 5% CMC w/v formed sharp pyramidal DMNs with sufficient mechanical strength. The maximum concentration of the antihistamine drug, chlorpheniramine maleate (CPM), that could be loaded in the selected polymer solutions was determined by performing drug solubility studies. The highest CPM solubility was achieved in the 15% w/v PVP/VA solution. Formulation studies have been performed to fabricate CPM-loaded DMN patches which are a subject of further characterisation and performance analyses using a variety of in vitro and ex vivo methods.

Bovine Immune phagome

Lavelle A^{1,2,3}, Crowley B¹, McDermott E⁴, Fanning L^{1,2}

¹*Department of Medicine*, ²*APC Microbiome Ireland*, ³*Department of Anatomy & Neuroscience*, ⁴*National University of Galway*

The immune system is educated in an unique manner by the lumen contents of the gut constantly stimulating both the innate and adaptive arms of the immune system. Immunoglobulin A (IgA) regulates the composition of gut microbiota. The IgA dominated lumen immunity in humans has been shown to differentially profile colitogenic bacteria from non-colitogenic bacteria. Whether such properties can be assigned to antibody-associated bacteriophage is unknown.

We sought to profile the antibody-associated phageome from colostrum and phage communities from paired faecal samples, n=4. Total bacteriophage communities from faeces were determined by next generation sequencing (Illumina). Similarly, total bacteriophage and immunoglobulin enriched bacteriophage communities were determined from colostrum.

The taxonomical classification of the sequences identified bacteriophage from Myoviridae, Podoviridae, Microviridae, Sphoviridae, Gokushovirinae and unknown. PCoA of Bray-Curtis divergence showed complete separate between animals, with in-animal communities showing large degrees of bacteriophage population relatedness. There was no cross-over between the bacteriophage communities present in faeces and colostrum. The immune phageome populations within colostrum were enriched for lactococcal phage. Electron microscopy identified podoviridae infection of bacteria within colostrum. Using 10nm gold labelling, IgA associated phage-like particles were visualised. In conclusion, this small study demonstrates that the bacteriophage can be IgA associated and IgG in colostrum, that these communities are not present within the faeces of the same animals raising the question as to where within the superhost is the bacteriophage repertoire seeded into colostrum. The immune biome is vastly under characterised and the functional significance of an immune phageome is current unknown.

Developing novel ionizable amino-polyesters for cell-type selective mRNA delivery

López Espinar A¹, Mulder L¹, Elkhatab M¹, Vucen S¹, Kowalski P¹

¹*School of Pharmacy, University College Cork*

Messenger RNAs (mRNAs) are promising new class of drugs with potential to revolutionize our approach for treatment of various disease. The main challenge to unlock the full potential of these therapies is to enable efficient intracellular delivery of mRNA. While lipids are the most clinically advanced platform for mRNA delivery to liver hepatocytes, polymeric nanoparticles display a potential to facilitate delivery to other tissues. Ionizable amino-polyesters (APEs) are a new class of polymers with pH dependent charge synthesized via ring-opening polymerization composed by amino-alcohols and lactones. The composition of these two moieties allows controlling different characteristics of the polymer, including hydrophobicity and linear or branched structure that can affect the physicochemical properties of the nanoparticles (NPs).

The aim of this project is to design, synthesize and characterize a library of novel ionizable APEs and establish structure-activity relationship (SAR) between polymer composition and mRNA delivery efficacy to various cell types. APE have been formulated into NPs using microfluidics together with lipid excipients, including 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (DOPE), cholesterol and 1,2-dimyristoyl-sn-glycero-3-phosphoethanolamine-N-[methoxy-(polyethyleneglycol)2000] (C14PEG2000).

A diverse library of 36 APEs with different chemical composition was formulated into NPs and evaluated in cancer, endothelial and immune cells. We identified polymers capable of efficiently deliver Firefly luciferase (FLuc) mRNA to all the cell lines showing promising results. Furthermore, we observed that while mRNA transfection in the cells and pKa of the NPs were mainly affected by the amino-alcohol composition, the length of the monomer side chain had a significant impact on APE-NPs size, encapsulation efficacy and surface charge.

Delivery of Tie2 mRNA to the endothelium as a novel strategy for the treatment of sepsis-induced multiple organ failure

Mulder L¹, van Meurs M², Moser J², Ryan K¹, Kowalski P¹

¹*School of Pharmacy, University College Cork*, ²*Department of Critical Care, University Medical Center Groningen, University of Groningen*

Sepsis involves a dysregulated host response to infection that can lead to life-threatening multiple organ failure. Due to the unacceptably high mortality and the lack of an effective pharmacological intervention, there is an unmet clinical need to develop novel therapeutic approaches to treat sepsis. Endothelial dysfunction is considered a hallmark in sepsis to which the loss of Angpt/Tie2 signalling, a main regulator of vascular integrity, contributes significantly, making it an attractive therapeutic target.

The global success of the SARS-CoV19 vaccines has showcased the enormous therapeutic potential of messenger RNA (mRNA) that allows for transient upregulation of protein expression and modulation of cellular pathways with unprecedented specificity. In this study, we aim to explore the therapeutic potential of delivering Tie2 mRNA to endothelial cells for the treatment of sepsis-associated multiple organ failure.

5-Methoxyuridine-modified mRNA encoding the human Tie2 gene (TEK) has been successfully synthesised and evaluated in vitro in Human Umbilical Vein Endothelial Cells (HUVECs). After 24 hrs, an evident increase in Tie2 mRNA levels was observed in mRNA-transfected HUVECs. To validate functional translation of our mRNA product into protein, a dose-dependent increase in Tie2 protein expression was measured of ± 2.5 to 6-fold compared to endogenous Tie2 protein levels. Furthermore, the biological activity of the Tie2 receptor tyrosine kinase and its localisation onto the cell surface were confirmed. As indicative for therapeutic purposes, initial results imply an early and transient protein kinetic profile. Future studies will investigate the biological consequence of Tie2 mRNA delivery on the endothelial barrier function during inflammation.

Session 2: from molecules to medicines. Co-Chairs: Professor Nicole Muller and Ms. Shauna Bell

10-minutes talks

An IBD-associated pathobiont collaborates with NSAID to promote inflammation and cell death in the susceptible host via the caspase-8/NLRP3 axis.

Singh R¹, Rossini V¹, R. Stockdale S¹, Saiz-Gonzalo G^{1,2,3}, Hanrahan N^{1,2}, D' Souza T¹, Clooney A¹, A. Draper L¹, Hill C^{1,4}, Nally K^{1,3}, Shanahan F¹, Andersson-Engels S^{5,6}, Melgar S¹

¹APC Microbiome Ireland, University College Cork, ²Department of Medicine, University College Cork, ³School of Biochemistry and Cell Biology, University College Cork, ⁴School of Microbiology, University College Cork, ⁵Irish Photonics Integration Centre, Tyndall National Institute, ⁶Department of Physics, University College Cork

Non-steroidal anti-inflammatory drugs (NSAIDs) are believed to exacerbate inflammation in patients with inflammatory bowel disease (IBD), but the mechanisms regulating NSAID-induced symptoms are unknown. Pathobionts such as adherent-invasive Escherichia coli (AIEC) are widely prevalent in the mucosa of patients with Crohn's disease (CD) and are considered relevant to CD pathogenesis. The inflammasomes such as NLRP3 are implicated in the maintenance of gut immune homeostasis and injury. Caspase-8 is a protein regulating programmed cell death, intestinal homeostasis, and inflammation. We hypothesise that the presence of AIEC might explain the NSAID-induced symptomatic worsening in IBD. Using IL-10^{-/-} mice, we show an aggravation of colitis in AIEC-colonised mice fed on an NSAID

supplemented diet accompanied by activation of the NLRP3 inflammasome, caspase-8 and cell death executors, e.g., caspase-3, PARP and Gasdermin D. However, IL-10^{-/-} mice colonised with AIEC alone or fed an NSAID supplemented diet alone did not develop colitis, highlighting the synergistic effect of both AIEC and the NSAID. Using small-molecule inhibitors targeting NLRP3 and caspase-8, we show an amelioration in colitis due to a reduction in pro-inflammatory cytokines, M1 macrophages, cell death (apoptosis/pyroptosis) and improved histology. 16S rRNA analysis identified an increased fecal abundance in Clostridium cluster XIVa species in both inhibitor-treated groups. In conclusion, our findings provide evidence and mechanistic insights into how NSAIDs and an opportunistic CD-associated gut pathobiont can synergise to worsen IBD symptoms and inflammation. The data suggest that targeting the caspase-8 and NLRP3 axis could be a potential therapeutic strategy for IBD patients with NSAID-worsened inflammation.

When benefits outweigh the risks: The First case of Triple Therapy CFTR modulation (KaftrioTM) in a solid organ liver transplant recipient in Ireland.

IBRAHIM H^{1,2}, Morrissey D^{1,2}, O'Rielly E¹, McCarthy M¹, Dorgan J¹, Fleming C¹, Howlett C¹, Vagg T^{1,2}, Twohig S¹, Murphy D^{1,2}, Crosbie O³, Schmidt D⁴, Plant B^{1,2}

¹Cork Adult CF Centre, Cork University Hospital, University College Cork, , ²HRB Clinical Research Facility Cork, University College Cork, ³Department of Hepatology, Cork University Hospital, , ⁴Department of Gastroenterology, Mallow General Hospital,

Conventional therapy in cystic fibrosis including improving airway clearance, aggressive antibiotics therapy for infections, and correcting nutritional deficits improved survival in Cystic Fibrosis (CF), but recently the addition of restoring the CFTR protein function via new small molecule modulator drugs (CFTR modulators) is transforming the disease for many patients. That said the risk of drug-drug interactions through the CYP3A4 and P-gp has led to exclusion of organ transplant recipients from the potential benefits of CFTR modulators as standard.

We describe the first case in Ireland of triple CFTR-modulator initiation (2021) in a CF patient post liver transplant (2014) with steadily declining lung function (percent-predicted (pp)FEV-1 dipped to as low as 31%) and increasing respiratory infections. CFTR modulation therapy resulted in 27 points improvement in ppFEV-1 (improved from 43% prior to therapy to 70% at 6 months of therapy). Sweat chloride dropped from a baseline of 110 mmol/L to 24 mmol/L within 8 weeks of therapy. Quality-of-life assessed using the CFQ-R showed significant improvement in all domains, respiratory domain improved from 44.4 to 94.4 at 6 months (a 4point improvement is regarded as clinically significant). Treatment was tolerated well, no detrimental effects on graft function, no elevation in liver function tests, and no requirement to change immunomodulation dose.

Further studies are required to assess the role of CFTR modulators in solid organ transplants. Consideration of all potential risks and benefits, and close monitoring of immunosuppressants level may help to mitigate existing concerns in this cohort of patients and aid decision making.

Defining the Therapeutic Potential of Class Specific Histone Deacetylase Inhibitors in an In Vitro Neuroinflammation Model of Parkinson's Disease.

Kraskoski N^{1,2}, O'Keeffe G^{1,2}

¹Department of Anatomy and Neuroscience, University College Cork, ²School of Medicine, University College Cork

Introduction: Parkinson's disease (PD) is a neurodegenerative disorder resulting from the progressive degeneration of midbrain dopamine neurons (mDA). Given the lack of disease modifying therapies, it is crucial to identify new neuroprotective agents. Neuroinflammation is a core aspect of PD pathology and a growing evidence base implicates a pathological imbalance in epigenetic regulation. To identify potential therapeutic targets, we performed gene co-expression analysis of the human SN to identify genes in these pathways that were co-expressed with mDA neuron markers. Subsequently we hypothesized that the neurotrophic factor GDF5, and the class IIa specific histone deacetylase inhibitor, MC1568, would protect dopaminergic neurons from proinflammatory cytokine-induced degeneration.

Materials and Methods: To test this hypothesis we used human SH-SY5Y cells which are a widely used model of human dopaminergic neurons. These were cultured with 100ng/ml GDF5, with or without 10ng/ml of TNF α or IL-1 β , for 72h. SH-SY5Y cells were additionally cultured in the presence of 0.1 μ M MC1568, with or without increasing concentrations of TNF α or IL-1 β , for 72h. We used neurite growth as a single cell readout of neurotrophic action.

Results: GDF5 or MC1568 co-treatment prevented the detrimental effects of TNF α and IL-1 β on neurite length.

Discussion: In summary these data show that GDF5 and MC1568 protect against proinflammatory cytokine-induced neurite degeneration in a model of human dopaminergic neurons. Given that axonal degeneration is now recognised as a crucial neuropathological event in PD, these data are an important first step in rationalising the use of these agents as novel therapies for PD.

Elevator pitch talks

Catching the Silent Killer: Can Long Non-Coding RNAs Diagnose and Classify Ovarian Cancer?

McCabe A¹, Dean K¹

¹University College Cork

Ovarian cancer is the most fatal gynecological malignancy, accounting for approximately 207,000 deaths worldwide per year. Low ovarian cancer survival rates are primarily driven by a lack of early screening methods and consequent late diagnosis. Current detection methods lack specificity and sensitivity, highlighting the apparent need to identify diagnostic and prognostic biomarkers for this disease. Furthermore, ovarian cancer is classified into five major subtypes; high grade serous, low grade serous, clear cell, endometrioid and mucinous ovarian cancer. Each subtype displays distinct genetic profiles, response to chemotherapy and prognosis. Therefore, it is not only imperative to be able to identify ovarian cancer, but also to classify the tumour subtype.

Advances in next generation sequencing have highlighted the roles played by long non-coding RNAs (lncRNAs) in both normal cellular processes as well as in various disease states, such as cancer. In particular, lncRNAs can be associated with clinicopathological variables in ovarian cancer, indicating possible use as novel diagnostic biomarkers.

In this project, RNA-sequencing data from 36 ovarian cancer cell lines and 7 normal control samples was analyzed. Overall gene expression patterns were used to stratify cell lines into five groups, which corresponded to each histological subtype. lncRNA expression was also investigated, establishing signatures that could effectively distinguish each subtype from both normal tissue and other ovarian cancer subtypes. Overall, this project justifies future investigations into the roles of identified lncRNAs as diagnostic tools, perhaps providing the basis for an early stage test for ovarian cancer.

Presence of CT-Evaluable Abnormal Body Composition Phenotypes is Associated with Poor Survival in Ambulatory Cancer Patients Receiving Systemic Therapy in Ireland (SARCONC Study).

Sullivan E^{1,2}, Daly L^{1,2}, Ní Bhuachalla É^{1,2}, Cushen S^{1,2}, Power D^{2,3}

¹*School of Food and Nutritional Sciences, College of Science, Engineering and Food Science, University College Cork,* ²*CancerResearch@UCC, University College Cork,* ³*Departments of Medical Oncology, Cork & Mercy University Hospitals*

Introduction: International studies have shown a high prevalence of malnutrition & muscle wasting in oncology patients, which increase risk of poor tolerance to chemotherapy, decreased quality of life & poorer survival. Currently their prevalence and impact in Irish patients has not been described.

Methods: A study of adult cancer patients was conducted over 5 years in 2 chemotherapy daywards in Cork, Ireland. Baseline anthropometry & body composition (BC) using computed tomography (CT) were recorded. Sarcopenia & low muscle attenuation (MA) were defined using published cut-offs. Overall survival (OS) was evaluated using Kaplan-Meier Curves & Cox Proportional Hazards Models, adjusting for known prognostic variables.

Results: Overall, 940 patients had evaluable CT scans (56% male, mean age 62 years) and 58% had stage IV disease. At baseline, 9% had BMI <20 kg/m² & 56% had BMI ≥25 kg/m². However, 73% had at least one abnormal BC phenotype. Specifically, 42%, 39% and 45% had cachexia, sarcopenia and low muscle attenuation, respectively. OS was poorer in those with abnormal BC phenotypes, (mean OS in non-metastatic 70.1 vs. 55.8 months (median not reached), Log rank p<0.001 and median OS in metastatic 25.6 months (95% CI: 20.2 – 30.9) vs. 14.2 months (95% CI: 12.3 – 16.1), Log rank p<0.001), after adjustment for site, stage, age, sex, performance status and inflammatory status (HR: 1.416 95% CI: 1.069 - 1.875, p=0.015). Conclusions: Most cancer patients experience 'hidden malnutrition'. As this is associated with poor survival, improved nutrition screening tools are required to identify wasting with excess adiposity.

Investigating the peri-operative trend of inflammatory mediators in breast cancer and association between differential inflammatory mediators and tumour characteristics

Cullinane C¹, Byrne J¹, Baldwin O¹, Foley C¹, Corrigan M^{1,4}, Connolly R^{2,3}, Redmond P¹
¹Department of Academic Surgery, ²Cancer Trials Group, ³Department of Medical Oncology, ⁴Breast Cancer Research Group

Introduction: Pre-clinical research has suggested that the surgical insult can promote the growth of new metastases and facilitate seeding of micrometastases into the circulation. Cytokine level elevation proportional to the magnitude of surgical stress has been described. The aim of this study was to define the peri-operative dynamics of IL-6, IL-8, TNF- α, IL1β and IL10 in patients with breast cancer and their association with tumour characteristics and surgical intervention.

Methods: Patients presenting for non-reconstructive breast cancer surgery, with non-metastatic disease, aged 18-85 years were screened for inclusion. Plasma samples were drawn pre-operatively, 4 hours post operatively and 2 weeks post operatively.

Results: Thirty-eight patients were analysed. Median age was 61(range 43-79). IL-6, IL-8 and IL-10 levels peaked early post-op and returned to near baseline levels at 2 weeks post op(p=<0.05). Early post-op IL-6 levels were lower in patients who had breast conserving surgery compared to patients who had a mastectomy(p= <0.01). A significant positive correlation was identified between age and pre-op and late post-op IL-6 levels. Early post-op IL-6 correlated with increasing tumour stage (r=0.3483, p=0.0321). There was also a correlation between post-operative IL-8 and TNFα levels with a lobular or mixed (lobular/ductal) breast cancer subtypes. A linear relationship was found between BMI and both early and late post-operative IL-6 levels(p=0.0246, p=0.0029). Only pre-operative IL-8 values correlated positively with BMI(p=0.0403).

Conclusion: This is the first study to define the systemic inflammatory dynamics in breast cancer surgery. Cytokine elevation appears to correlate with tumour characteristics and the magnitude of surgery.

Tailoring strategies to support the implementation of Dose Adjustment For Normal Eating (DAFNE), a structured patient education programme for people with Type 1 diabetes.

Riordan F¹, Kerins C¹, Humphreys M², Dinneen S³, McHugh S¹

¹University College Cork, ²St Columcille's Hospital, ³Office of the National Clinical Advisor Chronic Disease, ⁴Centre for Diabetes Endocrinology and Metabolism, Galway University Hospital,

Background: Evidence-based patient education programmes like DAFNE, prioritised for national implementation in Ireland, are recommended as part of diabetes management. Little is known about current DAFNE implementation and how best to support delivery. To address this gap, we are 1) working with Irish DAFNE centres to tailor strategies to support implementation, 2) evaluating the tailoring process, including how clinical stakeholders use evidence and guidance.

Methods: To identify potential determinants, we undertook a rapid review of structured diabetes education programmes and are analysing data from Irish and UK DAFNE centres. DAFNE teams complete a survey on their site characteristics before taking part in three group sessions to identify and prioritise determinants and select strategies, first, based on their own assumptions, needs and preferences, then considering guidance (if feasibility of addressing a determinant, importance, ubiquity, chronicity, and criticality), determinant-strategy alignment of strategies, and evidence of strategy effectiveness. Participants' experiences of the tailoring process will be evaluated via research logs, non-participant observation, surveys, and post-tailoring interviews.

Results: Overall, 91 centres delivered 1257 courses (2-74 courses across centres) and 6749 people attended; 9.5% dropped out. Determinants identified included: lack of available resources (e.g., staff schedules), access to knowledge and information (e.g., preparation) and networking and communication (e.g., experience working with one another). For the next stage, we have invited 18 sites to participate in the tailoring process.

Conclusion: This study will support implementation of the DAFNE programme, advance our current understanding of tailoring, including what is feasible and sustainable for clinical stakeholders in practice.

Trait schizotypy and motivation for cannabis use and cessation: a cross-sectional study.

O'Tuathaigh C¹, Dawes C², Bickerdike A³, O'Neill C³, Waddington J⁴, Moran P²

¹Medical Education Unit, University College Cork, ²School of Psychology, University of Nottingham, ³Department of Sport, Leisure, and Childhood Studies, Munster Technological University, ⁴School of Pharmacy and Biomolecular Sciences, Royal College of Surgeons in Ireland

Trait schizotypy has been implicated in the relationship between cannabis use and psychosis. Here we examined whether psychometrically assessed schizotypy might influence self-reported motivation for commencement and cessation of cannabis use.

Irish university students completed the Schizotypal Personality Questionnaire (SPQ), Cannabis Experience Questionnaire modified version (CEQmv) and motivation for cannabis use was measured using the Reasons for Use Scale (RFUS). Those whose total scores on the SPQ fell into top tenth percentile were recruited as high schizotypy group and those which fell into lowest tenth percentile were recruited as low schizotypy group. Independent-sample t-tests examined the differences in mean scores between high and low schizotypy and the five RFUS subscales (enhancement, social motive, coping with unpleasant affect, conformity and acceptance, and relief of positive symptoms and side effects).

Of 988 students who reported lifetime cannabis use, high schizotypy participants (n=101) scored significantly higher across all five-subscales of the RFUS relative to low schizotypy (n=100) (all $p < 0.001$). Among participants who reported regular cannabis use during the previous 12 months (n=359), high schizotypy participants (n=44) were more likely to endorse the following subscales: coping with unpleasant affect ($p < 0.001$); relief of positive symptoms and side effects ($p < 0.01$). Among those who confirmed discontinuation of cannabis use (n=486), high schizotypy participants were significantly more likely to report cessation due to emergence of paranoid symptoms ($p < 0.05$) or anxiety/depression symptoms ($p < 0.001$). Results present a role for schizotypy in motivation for cannabis use and cessation.

10-minutes talks

UniCoV-UCC – Surveillance and detection of SARS-CoV-2 on the UCC campus during the 2021-2022 Teaching year - Apps, antigens, saliva, wastewater and participation.

O’Riordan C³, Szafran J⁵, O’Leary J³, Broderick S², Kelly C², Egan C², Hickey M², Power M², O’Connell H³, McGarry L³, Dillon⁴, Culley G⁴, O’Toole R⁴, Allen E⁶, O’Callaghan J⁵, O’Leary N⁵, Horgan M², Byrne M³, Mac SharryJ¹

¹*Schools of Medicine and Microbiology, APC, UCC,* ²*School of Medicine, UCC,* ³*Student Health, UCC,* ⁴*IT Services, UCC,* ⁵*School of Microbiology UCC,* ⁶*UCC Academy*

Background: Detection of SARS-CoV-2 infection during the COVID-19 pandemic is key to disease prevention. The UniCoV project, a multi-university initiative, aimed to evaluate screening and surveillance of SARS-CoV-2 on University campuses using various detection platforms. Here we present the UCC findings.

Methods: Self-reported surveillance and detection of symptoms or SARS-CoV-2 was performed using a bespoke phone App using the Power Apps platform. Participants using the App could log symptoms, perform self-antigen tests, barcode scan self-sampled saliva tubes and receive a health status within minutes and Saliva RT-PCR results within hours. Campus wastewater surveillance was also performed to detect SARS-CoV-2 in effluent from two campuses buildings.

Results: 2,300 volunteers were recruited in the UCC UniCoV study from September 2021 to May 2022. Over 400 positive cases of SARS-CoV-2 were detected correlating with national rates; with detection of 1 % prior to December 2021 with two peaks of 5% and 6 % detection in early February and late March 2022. Both self-performed antigen and Lab based Saliva RT-PCR detection correlated, with saliva RT-PCR detecting positive cases approximately one day prior to antigen test positivity. The App allowed secure self-reporting but also push back delivery of lab results and follow up if required by the Student Health. Wastewater sampling detected SARS-CoV-2 consistently on campus and allowed detection from non-study participants.

Conclusion: On campus surveillance using self-reporting with App based solutions and laboratory confirmation has proven to be a highly effective method of disease surveillance with potential for future common and seasonal infections.

**“Short stops” and “footnotes”: End-of-life care and the recently qualified doctor.
Catherine Sweeney. Medical Educational Unit**

Sweeney C¹, O'Brien T², Bennett D¹

¹Medical Education Unit, UCC, ²School of Medicine, UCC

Rationale: Almost a half of Irish deaths occur in acute hospitals and 75% of these deaths are expected. People who are chronically ill and approaching death often have complex care needs, and much of their day-to-day medical care when in hospital is provided by recently qualified doctors (RQDs). However, there is considerable evidence that many RQDs believe that they lack knowledge and skills in this area and find it emotionally difficult.

Methods: Fifteen RQDs were interviewed about their experiences of end-of-life care. The data was thematically analysed and Communities of Practice and Landscapes of Practice theories were used as a lens to interpret the data.

Results: RQDs often felt poorly prepared for this area of practice. They frequently encountered a culture where the inevitability of death was denied and perceived that dying was sometimes diagnosed late. RQDs described having little legitimacy to change the direction of care when they anticipated that a patient was approaching death. Patients were “made palliative”, which often signified reduced medical input and RQDs witnessed “short stops” on ward rounds. Practices around palliative and EoL care varied considerably between teams, and RQDs had to carefully navigate the preferences of each consultant. They experienced considerable additional challenges, for which they were often unprepared, when on-call.

Conclusions: RQDs learned tacitly that EoL care was not an important aspect of the practice of many specialties. To improve EoL care experiences for patients, families and RQDs, cultural aspects must be addressed.

Fatal Fetal Anomaly: Exploring experiences of women and their partners.

Jackson P¹, Dennehy R^{1,2}, Power Walsh S¹, O'Donoghue K^{1,2}

¹Pregnancy Loss Research Group, University College Cork, ²INFANT Research Centre, Cork University Maternity Hospital

Objective: Parents faced with the difficult diagnosis of a fatal fetal anomaly (FFA) may have to choose between continuation or termination of the pregnancy. In January 2019, the provision of termination of pregnancy for FFA was legalised in Ireland. Little is known about parents' experiences of continuing and terminating their pregnancy following a FFA

diagnosis in this new context. This study sought to explore the care experiences of parents whose pregnancy was diagnosed with a FFA.

Methods: A qualitative study using in-depth semi-structured interviews and interpretative phenomenological analysis was undertaken. Purposeful sampling was used to recruit ten parents, six women and four of their male partners. Parents' experiences of care reflected four of the six fetal medicine units in Ireland. Parents recruited were equally balanced between those that terminated the pregnancy and those that continued.

Results: Three superordinate themes were identified: Consistency of care; Impact of communication; and Recognition. Inconsistency of care at times left parents feeling like their loss was not fully acknowledged by service providers. It was important to parents that the trauma of the experience was recognised, as well as recognition of how the diagnosis changed the way they viewed the maternity setting and changed how they approached their relationship with the baby. Parents highlighted how clear, empathetic, and thoughtful communication from healthcare professionals positively impacted their experience.

Conclusions: There is a need for consistent, well communicated, and comprehensive care, which encourages a perinatal palliative care approach that is individual to the parents.

Complementary and Alternative Medicine: Determining the use of biologically based practices among Irish cancer survivors.

Scannell C¹, Sullivan E¹, Dahly D², Matvienko-Sikar K³, Grimes D⁴, Power D⁵, Ryan A¹

¹*School of Food and Nutritional Sciences, College of Science, Engineering and Food Science, University College Cork, ,* ²*HRB, Clinical Research Facility, University College Cork,* ³*School of Public Health, University College Cork,* ⁴*School of Physical Sciences, Dublin City University ,* ⁵*Department of Medical Oncology, Mercy University Hospital and Cork University Hospital*

Background: Biologically Based Practices (BBP) are a form of Complementary/Alternative Medicine (CAM) including herbal-remedies, special diets and vitamin/mineral supplements, and their use is increasing as a cancer self-medication tool. BBP has the potential to cause harm. Little is known about its safety/efficacy, or possible interactions with conventional treatments. The aim of this research is to conduct the first national survey of CAM-use in Irish cancer survivors.

Methods: The survey was conducted online and was informed by socio-demographic and clinical characteristics seen in previous CAM literature. The survey contained 77 questions, patient representatives reviewed the survey to ensure readability/acceptability. Participants were asked about CAM use before/after their cancer diagnosis. The survey used primarily radio-type or checkbox responses, with some open text fields for highly diverse variables. Likert scales were utilised. Analysis was conducted using SPSS v26.

Results: In total, 363 valid responses were received, 21% were male. Mean (SD) age was 52 (12) years. Breast cancer was the most common cancer (53%), and 67% were in remission. BBP 'Ever-Use' was reported by 42%. BBP use increased from 29% to 34% after cancer diagnosis ($p < 0.001$). BBP 'Daily-Use' also increased significantly from 14.4% to 24.2% ($p < 0.001$). 2% of participants reported using BBP as an alternative therapy (instead of conventional medicine).

Conclusion: BBP use is common in Irish cancer survivors, despite not being recommended by ESPEN or the World Cancer Research Fund for cancer prevention/treatment. More training is required for healthcare professionals to be able to confidently enquire and make recommendations about CAM.

Pregnancy Outcomes Following Recurrent First Trimester Miscarriage: A Retrospective Cohort Study.

Linehan L¹, San Lazaro Campillo I², Hennessy M², Flannery C², O'Donoghue K²

¹INFANT Centre, Department of Obstetrics and Gynaecology UCC, 5th Floor Cork University Maternity Hospital, ²Pregnancy Loss Research Group, Department of Obstetrics and Gynaecology, 5th Floor, Cork University Maternity Hospital

Background: We undertook a retrospective cohort study to identify subsequent pregnancy outcomes in women with recurrent miscarriage (RM), defined as three consecutive first-trimester miscarriages, to examine if maternal characteristics were linked to pregnancy outcomes.

Methods: Women attending a consultant-led RM clinic at a tertiary university hospital in the Republic of Ireland over a 12-year period (2008 - 2020) with a confirmed diagnosis of first-trimester RM were eligible for inclusion. Women with non-consecutive miscarriages or ectopic pregnancy were excluded. Maternal characteristics were gathered from paper and electronic medical records. Data were analysed using SPSS (V27). Associations between maternal characteristics and outcomes were explored using χ^2 test, (significance; $p < 0.05$). Multinomial regression analysis was performed using a stepwise approach.

Results: 748 women were included; 573 women had a subsequent pregnancy (77%); 359 (63%) had a live birth and 208 (36%) had a pregnancy loss.

Women aged 35-39 were more likely to have a livebirth than no pregnancy (RR 2.3(95% CI [1.51,5.30])). Women aged 30-34 were more likely to have a livebirth (RR 3.74 (95% CI [1.80,7.79])) or a miscarriage (RR 2.3 (95% CI [1.07,4.96])) than no pregnancy. Smokers were less likely to have a livebirth (RR 0.37 (95% CI [0.20, 0.69])) or a miscarriage (RR 0.45 (95% CI [0.22, 0.90])) than no further pregnancy.

Conclusion: Age, smoking and balanced translocations are associated with subsequent pregnancy outcomes. This highlights the importance of tailored counselling regarding individual risk factors for women with RM.

What Do Older Adults And Health Care Professionals Look For In A Food Product?

O'Mahony L^{1,8}, O'Shea E¹, O'Connor E^{2,3,4}, Tierney A⁵, Dunne N⁶, Harkin M⁷, Harrington J⁸, Kennelly S⁹, Tobin K¹⁰, Arendt E¹¹, O'Toole P^{4,12}, Timmons S^{1,4}

¹Centre for Gerontology and Rehabilitation, ²Department of Biological Sciences, University of Limerick, ³Health Research Institute, University of Limerick, ⁴APC Microbiome Ireland, Alimentary Pharmabiotic Centre, University College Cork, ⁵School of Allied Health, Health Implementation Science and Technology Research Group, University of Limerick, ⁶Family Carers Ireland, ⁷Age & Opportunity, ⁸School of Public Health, University College Cork, ⁹National Primary Care Strategy and Planning, Health Service Executive, Ireland, ¹⁰Clean Technology Centre, Munster Technological University, ¹¹School of Food and Nutritional Sciences, University College Cork, ¹²School of Microbiology, University College Cork

The Mediterranean diet (Medi-diet) can support healthy ageing but isn't the habitual diet of middle-aged-to-older adults in Ireland, with additional accessibility and tolerability issues of a high-fruit, high-vegetable diet. Providing key Medi-diet nutrients in a food product is a novel approach to this challenge. This research aims to explore what 'younger old' adults and healthcare professionals (HCPs) would value in such a novel food product.

Semi-structured 1:1 interviews and focus groups (FGs) were conducted remotely from July 2021 to January 2022. Older adults (55+) were recruited through relevant social, retirement and disease-support groups. Purposive sampling recruited a gender balance and a range of age/disease profiles. HCPs were recruited through researcher networks and professional associations. Interviews/FGs were recorded, transcribed, and underwent inductive thematic analysis.

Older adults (n=47; 50% male) were mostly aged 60-69 years (48.9%). Recruited HCPs (n=26) included dietitians (n=8); geriatricians (n=5); therapists (n=4); and nurses, pharmacists, catering managers, and meal-delivery coordinators (n=2 each). Participants supported a food product which provided a nutrient-dense "boost", or supplementary fibre/protein, but generally preferred a "food-first" approach, not a "silver bullet". Older adults largely associated functional foods with probiotic products "to repair the gut", for consumption "every now and then". The product should reflect changing dentition (texture), appetite (portion size), and dexterity (packaging; preparation ease); branding should not stigmatize older adults. Participants preferred premade soups or cake-type bars to drinks.

A novel food product could supplement a balanced diet for older adults, providing high-protein and high-fibre for gut health, complimenting an overall lifestyle approach.

TeCC (TeleHealth, Cystic Fibrosis, Corona-Virus) Study in a previous telehealth-naive-centre; Clinical challenges, outcomes, and user experience in the first six months of a global pandemic.

Morrissy D^{1,3}, Vagg T^{1,2,3}, McCarthy M¹, Dorgan J¹, Fleming C¹, Howlett C¹, Eustace J^{1,3}, Plant B^{1,3}

¹Cork Adult CF Centre, Cork University Hospital, University College Cork, ²School of Computer Science and Information Technology, University College Cork, ³HRB Clinical Research Facility Cork, University College Cork

Background: Covid-19 made it necessary to establish telehealth as a first default for reviews in a previously telehealth-naive clinic.

Objective: To establish and assess telehealth in the first 6 months of Covid19 pandemic.

Method: A 'Covid Pack' of medical equipment and details for a teleconference platform to replicate the in-person clinic format was sent to each patient (94 patients reviewed in the first 6 months). A retrospective chart review comparing patients clinical metrics pre and post roll out was conducted. Usability and Acceptance were measured with patients(p) and staff(s) via a number of standardised surveys: System Usability Scale (SUS), TeleHealth Usability Questionnaire (TUQ), and our own qualitative survey.

Results: Data from 80 patients and 11 staff members show an overall positive response to our remote-clinics. The SUS received a mean score of 82 (p) and 83 (s) out of 100. The TUQ received a total score of 6.4 (p) and 6.1 (s) out of 7, with 'Interaction Quality' and 'Satisfaction and Future Use' being the highest categories (p median 6.75) and Reliability as the lowest rated category (p median 5.1). Qualitative survey data show that while patients and staff are positive about the convenience of the remote-clinic, an in-person face-to-face review remains important.

Conclusion: Initial 6-month data are positive for the remote clinic as a first default during a pandemic. The data shows a positive trend for the usability and acceptance by all stakeholders, but it is not a replacement for physical clinics.

Congenital anomalies among early neonatal deaths and very low birthweight infants in Ireland: Maternal, fetal and care characteristics

Peters J¹, Leitao S^{2,3,4}, Corcoran P^{2,3,5}, Greene R^{2,3,6}

¹*School of Medicine and Health, University College Cork,* ²*National Perinatal Epidemiology Centre, University College Cork,* ³*Department of Obstetrics and Gynaecology, School of Medicine and Health, University College Cork,* ⁴*Pregnancy Loss Research Group, Department of Obstetrics and Gynaecology, University College Cork,* ⁵*Department of Epidemiology and Public Health, University College Cork,* ⁶*Cork University Maternity Hospital*

Very low birth weight (VLBW) infants have an increased incidence of congenital anomalies, a leading cause of early neonatal death (ENND). This study examined maternal, fetal, and perinatal care characteristics among ENNDs and infants of VLBW ($\leq 1500\text{g}$ and/or ≤ 29 weeks' gestation) with or without MCA.

Anonymised data from the National Perinatal Epidemiology Centre (NPEC) annual audits on Perinatal Mortality (PM) and on VLBW infants in Ireland (2014-2019) were used. Descriptive, chi-square, risk, and Poisson regression analyses were performed in SPSS.

Data pertaining to 996 ENNDs and 3466 liveborn VLBW infants in the Republic of Ireland from 2014-2019 were examined. MCA was identified in 43.37% (n = 432) of cases. Chromosomal abnormalities (n = 118, 27.3%), cardiovascular defects (n = 60, 13.9%), genitourinary (n = 59, 13.7%), and central nervous system disorders (n = 52, 12.0%) were next

most common precipitants of death. Overall, 49.6% of VLBW neonates with MCA (n = 140) did not survive. The most frequently reported MCA among VLBW infants was chromosomal (n = 75, 26.4%). Significant associations were found between MCA and maternal, fetal, and perinatal care characteristics, including pre-existing hypertension, SGA, access to prenatal care, birth hospital type, caesarean delivery, and antenatal steroid administration.

The main types of MCA contributing to ENNDs and occurring in VLBW infants born alive from 2014-2019 were identified. Mortality risks with MCA as the cause of ENND were calculated. Results may provide clinicians and parents more accurate information to support evidence-based decision making with a new diagnosis of congenital anomaly.

Poster Presentation Abstracts

Online

5. Learning in the community: medical student's experiences of training within a community paediatric clinic set in a low-income neighbourhood

Buckley L¹, Curtin M¹, Gibson L¹, Cornally N¹, Harford K²

¹University College Cork, ²Let's Grow Together! Infant & Childhood Partnerships

Background: Undergraduate medical training in Ireland comprises of clinical training largely within teaching hospitals, with less emphasis on training within community-based settings. Students in the south of Ireland were offered a unique opportunity to participate in a community-based, interdisciplinary paediatric clinic located in an area of intergenerational disadvantage. The aim of this study was to capture students' experiences and to gain insight into the perceived impact of community-based training on undergraduate medical education.

Methods: A mixed-methods design was used. Research tools included an online questionnaire and qualitative reflective essays. Microsoft Excel generated descriptive statistics from quantitative questionnaire responses. Thematic analysis of qualitative data was guided by Braun & Clarke's Framework. Research was reported in line with Mixed Methods Research Design Standards.

Results: 52 medical students consented. 32 (62%) responded to the online questionnaire. 94% felt the clinic provided an opportunity to apply knowledge and skills, 96% reported the experience strongly improved their understanding of child health and development, and 90% reported the experience was extremely valuable to their overall learning. 20 reflective essays were randomly selected. Qualitative analysis shows engagement with vulnerable families in the community increased knowledge, informed practice, and heightened awareness of social deprivation and its impact on child development. Student's understanding of effective models of community paediatrics was broadened.

Conclusions: Exposure to a community paediatric clinic influenced undergraduate medical education through experiential and transformative learning. Our experience of teaching clinical skills in the community could be replicated across medical fields to the benefit of the wider community.

6. eHealth Interventions to Support Self-Management in those with Musculoskeletal Disorders: 'eHealth: It's TIME': A Scoping Review

Kelly M¹, Fullen B³, Martin D⁴, McMahon S³, McVeigh J¹

¹Discipline of Physiotherapy, School of Clinical Therapies, College of Medicine and Health, University College Cork, ²Department of Physiotherapy, Mercy University Hospital, ³School of Public Health, Physiotherapy and Sports Science, University College Dublin, ⁴School of Health and Social Care, Teesside University

Background:

eHealth-mediated interventions are considered an option to support self-management in those with musculoskeletal disorders (MSDs). This scoping review aimed to chart the evidence regarding eHealth modalities, musculoskeletal diagnosis, and outcomes of eHealth-mediated self-management support interventions in persons with MSDs and identify any gaps within the literature.

Methods

Six databases (MEDLINE, CINAHL, PsycINFO, Embase, Scopus, Cochrane Database of Systematic Reviews), seven grey literature sources and reference and citation lists of included studies were searched from inception to July 2020. Published studies of adults with a MSD utilising an eHealth intervention to support self-management were included. Studies were limited to those published in English. Two reviewers independently screened all studies. Data were extracted by one reviewer and reviewed by another reviewer.

Registration: Open Science Framework (<https://osf.io/29rd6>).

Results

After screening 3377 titles and abstracts and 176 full-texts, 87 studies fulfilled the eligibility criteria. Most studies were published in the last five years (55%), with almost one-third originating in the USA (32%). The most common eHealth modality type was internet-based (35%) with almost one half (47%) of studies involving participants with widespread musculoskeletal symptoms. The most commonly reported outcomes related to body functions (i.e. pain intensity) (n=67; 45%), followed by activities and participation (i.e. function) (44%), with environmental factors (i.e. healthcare utilisation) the least commonly reported (20%).

Conclusions

Considerable variation exists within the eHealth-mediated self-management support intervention literature. Research is needed on the role of eHealth-mediated self-management support interventions across a broad range of MSDs to guide clinical practice.

8. How much is the lack of retention evidence costing trial teams in Ireland and the United Kingdom?

Murphy E¹, Shiely F¹, Treweek S²

¹*Trials Research and Methodologies Unit, Clinical Research Facility Cork, University College Cork,*

²*Health Services Research Unit, University of Aberdeen*

Background

Evidence to support the use of many retention strategies in clinical trials is lacking. Despite this, trial teams still need to have some form of retention strategy in their trials to try and avoid high attrition rates. This study aimed to estimate how much this lack of retention evidence might be costing trials in Ireland and the United Kingdom.

Methods

We selected the top ten most routinely used retention strategies by Clinical Trial Units in the United Kingdom and made assumptions as to how each of these strategies was most likely to be implemented in Ireland and the U.K. and the costs involved in doing this.

Results

Retention strategies were often poorly specified, meaning we had to make assumptions about implementation and in some cases about the strategy itself. Based on our assumptions, some retention strategies can be extremely expensive; some of the costliest strategies included "data collection scheduled with routine care" (€900 - €32,503.25). Others such as "telephone reminders for questionnaire response" (€34.58 - €568.62) and "targeted recruitment of sites/GPs" (€30 - €1,620) were less costly compared to the other strategies however none of these strategies have compelling evidence of effectiveness.

Discussion

The resources invested in the use of some retention strategies may outweigh known or imagined benefits on retention. Where benefits are currently unknown, evaluation should be a priority.

Conclusion

More evaluation of the effectiveness and cost of trial retention strategies is needed to avoid widespread use of strategies that are both expensive and ineffective.

9. Patient perceptions of the challenges of recruitment to a renal randomised trial registry: a pilot questionnaire-based study

Murphy E¹, O'Keeffe A¹, O Shea N¹, Long E², Eustace J¹, Shiely F¹

¹*Trials Research and Methodologies Unit, Clinical Research Facility Cork, University College Cork,*

²*Department of Nephrology, Cork University Hospital*

Background

Randomised controlled trials (RCTs) are the gold standard for demonstrating the efficacy of new therapies. However, issues of external validity often affect real-world application of results. Using registries to conduct RCTs is a reasonably new practice, therefore there is limited literature on patient motivators, barriers, and consent to registries for conducting RCTs. The purpose of our study was to establish the factors that motivate and/or inhibit patients from joining a registry for RCTs and to determine what information matters to patients when making an enrolment decision to participate in such a registry.

Methods

We conducted a cross-sectional questionnaire-based study at a dialysis centre in Southwest Ireland representing a catchment patient population of approximately 430,000. Descriptive statistics were produced, and open-ended questions were analysed by thematic analysis

Results

Eight-seven patients completed the questionnaire. Reasons for participation in a registry included personal and altruistic benefits. Barriers to participation were time and travel requirements associated with registry participation, data safety concerns, risks, and concerns that registry participation would impact current treatment. Although 29.8% of patients expressed concern regarding their data being stored in a registry, 79.3% were still willing to consent to have their data uploaded and stored in a registry for conducting RCTs.

Conclusion

Challenges to recruitment to registries for RCTs exist, but addressing the identified concerns of potential participants may aid patients in making a more informed enrolment decision and may improve recruitment to registries, and by extension, to RCTs conducted using registries.

10. Involving stakeholders with professional and lived experience in the development of guideline-based care quality indicators: Insights from the RE:CURRENT Project

Hennessy M^{1,2,3}, Linehan L^{1,2,3}, Dennehy R^{1,2,3}, Devane D^{2,4,5}, Rice R^{1,6}, Meaney S⁷, O'Donoghue K^{1,2,3}
¹Pregnancy Loss Research Group, Department of Obstetrics and Gynaecology, University College Cork, ²INFANT Research Centre, University College Cork, Cork University Maternity Hospital, ³College of Medicine and Health, University College Cork, ⁴School of Nursing and Midwifery, National University of Ireland, Galway, ⁵Evidence Synthesis Ireland, National University of Ireland, Galway, ⁶School of Applied Social Studies, University College Cork, ⁷National Perinatal Epidemiology Centre, University College Cork

The population prevalence of recurrent miscarriage (RM) is 1–3%, depending on the definition used, i.e. 2 or ≥3 miscarriages. There are uncertainties around how to organise RM care, including debates relating to the investigations and treatments that should be provided. Standardised care pathways tailored to women/couples who experience RM are needed. In this paper, we describe our experiences of involving a diverse stakeholder group in the RE:CURRENT (Recurrent miscarriage: Evaluating current services) Project in the development of quality indicators for RM care which will be used in a national service evaluation.

The process comprised six stages: (i) systematic review to identify and synthesise recommendations for RM care; (ii) two-round modified e-Delphi survey to develop consensus on recommendations and outcomes; (iii) four virtual meetings to further develop this consensus; (iv) develop list of candidate indicators; (v) survey to achieve consensus on the final suite of indicators; (vi) virtual meeting to agree the final set of indicators. We sought feedback on the development process from stakeholders using participatory methods.

One hundred and ten indicators were prioritised for inclusion in the final suite, from an initial list of 373 recommendations and 14 outcomes: (i) structure of care (n=20); (ii) counselling/supportive care (n=7); (iii) investigations (n=30); treatment (n=34); outcomes (n=19). Participants provided feedback on the process around three main themes: accessibility; richness in diversity; streamlining the development process.

It is important, and feasible, to develop guideline-based indicators with a diverse stakeholder group. Insights into our experiences may help others undertaking similar projects.

11. How we define recurrent miscarriage matters: Views of people with lived and/or professional experience

Dennehy R^{1,2,3}, **Hennessy M**^{1,2,3}, Meaney S⁴, Matvienko-Sikar K⁵, O'Sullivan-Lago R⁶, Ui Dhubhgain J^{7,8}, Lucey C⁷, O'Donoghue K^{1,2,3}

¹*Pregnancy Loss Research Group, Department of Obstetrics and Gynaecology, University College Cork,*

²*INFANT Research Centre, University College Cork,* ³*College of Medicine and Health, University College Cork,* ⁴*National Perinatal Epidemiology Centre, University College Cork,* ⁵*School of Public Health, University College Cork,* ⁶*Waterstone Clinic,* ⁷*RE:CURRENT Research Advisory Group,*

⁸*Miscarriage Association of Ireland*

Recurrent miscarriage (RM) affects 1-3% of women/couples of reproductive age depending on the definition used, e.g. whether 2 or ≥ 3 miscarriages, and if consecutive or not. Stakeholders' views of how RM is defined have received limited attention to-date. A definition reflects the medical evidence and values of a society at the time, thus warrants ongoing review.

We aimed to explore views of women and men with lived experience of RM, and those involved in the delivery/management of services and supports, on how RM is defined.

We adopted a qualitative study design, incorporating semi-structured interviews. We used purposive sampling to recruit participants in the Republic of Ireland, ensuring diverse perspectives were included. Women and men with lived experience of ≥ 2 consecutive first-trimester miscarriages were recruited via health professionals and social media; other participants via the research team's networks. Interviews were audio-recorded, transcribed, pseudo-anonymised, and analysed using reflexive thematic analysis.

We conducted interviews with 42 health professionals/service providers and 13 women and 7 men with lived experience of RM (June 2020-February 2021). We generated three inter-related themes from the data: (i) The need for a standardised definition of recurrent miscarriage—Finding a balance between research evidence, individual needs, and healthcare resources, (ii) The definition is a route to finding an answer and/or validating women/couples' experience of loss, and (iii) Working around the definition—Advocacy and impacts.

A nuanced approach to defining RM is warranted, one which is evidence-informed, recognises the individual needs of women/couples, and considers healthcare resources.

12. eHealth Interventions to Support Self-Management: Perceptions and experiences of People with Musculoskeletal Disorders and Physiotherapists - 'eHealth: It's TIME': A Qualitative Study

Kelly M¹, Fullen B², Martin D³, Bradley C⁴, McVeigh J¹

¹*Discipline of Physiotherapy, School of Clinical Therapies, College of Medicine and Health, University College Cork*, ²*School of Public Health, Physiotherapy and Sports Science, University College Dublin, Dublin, Ireland*, ³*School of Health and Social Care, Teesside University*, ⁴*Department of General Practice, University College Cork, Cork, Ireland*

Objectives: The aim of this study was to explore the perceptions of eHealth-mediated supported self-management from the perspective of people with musculoskeletal (MSK) disorders and physiotherapists who work in this clinical area. These views will be used to inform the development and implementation of an eHealth intervention for those with MSK conditions.

Design: A qualitative interpretive descriptive approach was taken, and semi-structured telephone interviews conducted. Interviews were audio-recorded and transcribed verbatim. Transcripts were analysed using reflexive thematic analysis.

Setting: Musculoskeletal physiotherapy services (public and private) in the Republic of Ireland

Participants: 13 physiotherapists who worked in MSK care (age range = 26 – 42; 6 female, 7 male) and 13 people with MSK disorders (age range = 24 – 77; 9 female, 4 male).

Results: Four main themes were identified: 1) Individualised care, 2) Expectations 3) Education and empowerment, 4) Optimising technology. Both physiotherapists and people with musculoskeletal disorders were open to the future use of eHealth interventions within a flexible, blended care model. Participants expressed concerns around assessment and diagnosis and establishing a therapeutic relationship and felt eHealth should be reserved for follow up purposes. There was a consistent view expressed that eHealth could facilitate aspects of self-management support.

Conclusions: eHealth-mediated self-management support interventions were broadly acceptably, predominately as a follow-up option.

14. Trends in drug- and vaccine-based dissolvable microneedle materials and methods of fabrication

Moore L¹, Vucen S¹, Moore A¹

¹*University College Cork*

Microneedle patches, also called microarray patches (MAP), are an emerging technology for delivery and sampling of drugs, vaccines and other materials. This review focuses on the materials and methods used to fabricate dissolvable microneedles (DMN) for pharmaceutical use. We outline the relative use of excipients, active pharmaceutical ingredients (API) and methods used for DMN fabrication. An extensive search of primary literature, up to April 2021, identified 328 papers under

the key terms “dissolvable microneedles” or “polymeric microneedles”. We based the classification of materials on pharmacopoeia definitions. The majority (76%) of the identified publications examined licensed or model therapeutic small molecule drugs. Most reports (58%) focused on drugs or vaccines that are licensed for clinical use. The relative use of excipients with drug-containing compared to vaccine-containing DMN is discussed. Ten polymers and sugars were used for both drug and vaccine DMN. The most frequent methods to produce DMN were casting into moulds using centrifugation or vacuum filling. Novel methods reported include centrifugal lithography and 3D printing. This review provides insight into material selection, the feasibility of production methods at industrial scale and outlines considerations for novel DMN patch fabrication.

15. A national survey of women’s experiences of recurrent miscarriage care

Hennesy M¹, Hennesy M¹, Dennehy R¹, Matvienko-Sikar K², Lucey C³, O'Donoghue K¹
¹Pregnancy Loss Research Group, Infant Research Centre, Cork University Maternity Hospital, University College Cork, ²School of Public Health, University College Cork, ³RE:CURRENT Research Advisory Group

Objective

This study aims to explore the experiences of women who have received recurrent miscarriage (RM) care in Ireland.

Methods:

A cross-sectional study was conducted using an anonymous web-based national survey. Women over 18 who have experienced two \geq first trimester miscarriages in the last ten years and who have received care in Ireland were invited to participate. The survey was purposefully designed and distributed online using Qualtrics through emails, social media accounts and support groups. Analysis was conducted using Stata.

Results

In total, 135 women were eligible; 79% were aged 53-44yrs (n=106), 95% were white Irish (n=128), 84% were married (n=114). 24% of women rated a poor RM care experience (n=32), and that Healthcare professionals (HCP) in different places did not work well together (60%, n=81). Women who had a HCP to talk to about their worries/fears (RRR 6.11 [95% CI: 1.41-26.41]) and whose partner could ask questions about investigations (RRR 3.83 [95% CI: 1.01-14.48]) were more likely to report a good RM care experience (vs poor). Women who received a treatment plan (n=70) for their RM were more likely to rate a good care experience (RRR 3.71 [95% CI: 1.28-10.71]). For women who progressed to pregnancy (n=97), those who received answers they could understand (RRR 8 [95% CI: 0.95-67.13]) were more likely to rate a good RM care experience.

Conclusion

This study demonstrates women’s experience of RM care, providing an understanding of the drivers/mechanisms that shape their care experiences to help inform and improve RM care in Ireland.

16. Exploring first time mothers' experiences and knowledge about behavioural risk factors for stillbirth

Escanuela Sanchez T¹, Matvienko-Sikar K², Meaney S³, Byrne M⁴, O'Donoghue K¹

¹*Pregnancy Loss Research Group, Infant Centre, Cork University Maternity Hospital, University College Cork.*, ²*School of Public Health, University College Cork.*, ³*National Perinatal Epidemiology Centre, Cork University Maternity Hospital, University College Cork.*, ⁴*Health Behaviour Change Research Group, School of Psychology, NUI Galway*

Background

Modifiable factors such as substance use, lack of attendance to antenatal care, overweight or obesity and sleeping position are associated with a higher risk of stillbirth. The aim of this qualitative study is to use an interpretivist approach to explore women's awareness of behavioural risk factors for stillbirth and experience with antenatal education.

Methods

Purposive sampling was implemented in Cork University Maternity Hospital. Women were eligible if they were primiparous, at least eighteen years of age, and had an uncomplicated pregnancy and delivery. Individual semi-structured online interviews were therefore conducted with 18 women. Reflexive thematic analysis was used for analysis.

Results

Four themes were identified: Attitudes toward behaviour change; awareness regarding stillbirth and risk factors; silence around stillbirth and risks; and attitudes toward receiving information about stillbirth. Women spoke about behaviour change in terms of outcomes for themselves and/or their babies, and most of the changes made by the women were perceived as natural and easy to manage. Awareness of stillbirth was limited among interviewed participants, including a lack of recognition of behaviours being associated to the risk of stillbirth. Results suggest that there is a silence around stillbirth, including in antenatal care, which hinders education and information provision. However, most women in our sample highlighted the value of receiving information and extra education around modifiable risk factors and stillbirth.

Conclusion

Providing accurate information about the behaviours associated with adverse outcomes such as stillbirth might facilitate preventive efforts by heightening understanding about the associations between behaviours and stillbirth.

18. National Survey of women on the Irish Gestational Trophoblastic Disease Registry

Joyce C^{1,2,3,4,5}, Coulter J², Sisk C², McCarthy T³, O'Donoghue K^{1,2,4}

¹*Dept. of Obstetrics & Gynaecology, University College Cork*, ²*Dept. of Obstetrics & Gynaecology, Cork University Maternity Hospital*, ³*Dept. of Biochemistry & Cell Biology, University College Cork*, ⁴*Pregnancy Loss Research Group, The Irish Centre for Maternal and Child Health Research (INFANT), University College Cork*, ⁵*Dept. of Clinical Biochemistry, Cork University Hospital*

Objective

Gestational trophoblastic disease (GTD) is a rare disorder requiring expert care in GTD centres to ensure maximum cure rates. A cross-sectional postal survey was performed to evaluate the experience of women enrolled on the National GTD registry over a 5-year period.

Method: A total of 504 questionnaires were distributed over a 10-month period. The 27-item questionnaire containing open and closed-ended questions addressed five main areas: (a) registration with GTD centre; (b) prior knowledge of molar pregnancy; (c) diagnosis of GTD at local hospital; (d) monitoring human chorionic gonadotrophin (hCG) levels (e) patient experience. Data was collected and analysed using SPSS v28 software.

Results: The survey achieved a satisfactory response rate of 42.6%. The survey found that a fifth of respondents (23.6%, n=48) did not agree that other medical professionals with whom they interacted throughout their treatment understood GTD. In addition, a quarter of participants (26.5%, n=57) reported having to explain to healthcare professionals why they needed hCG monitoring. Almost half the participants (49%, n=106) rated availability of a rapid hCG result as their top priority and a significant number of women (34%, n=67) would opt for urine hCG monitoring if this were available. Categories which emerged in the open-ended questions included psychological support, bereavement counselling and peer support groups.

Conclusions: The survey identified a knowledge gap around molar pregnancy amongst healthcare professionals which could be addressed in medical and nursing curricula. Future service development should consider the provision of bereavement counselling and psychological support for these women.

19. Characteristics associated with perinatal mortality in multiple pregnancies

O'Connor C^{1,2,3}, Leitao S^{2,4}, O'Donoghue K^{1,2,3}

¹Infant Centre, University College Cork, ²Pregnancy Loss Research Group, University College Cork, ³Department of Obstetrics and Gynaecology, University College Cork, ⁴The National Epidemiology Centre, University College Cork

Objective: Twin pregnancies have an increased risk of multiple adverse outcomes which includes a higher risk of perinatal mortality compared to singletons. This study aims to examine perinatal mortality in twins compared to singletons and investigate the characteristics associated with this.

Method: This retrospective study includes 4339 perinatal deaths occurring in any of the 19 maternities within the Republic of Ireland, from 2014-2019. The type of perinatal mortality, maternal characteristics, antenatal care factors, and cause of death were analysed. Pearson chi-squared tests studied the difference between mortality in multiples and singletons.

Results: A total of 4339 perinatal mortalities were included; 3740 singletons (86%) and 594 multiples (14%). The mortality rate was significantly higher in multiples for early neonatal deaths (51% versus 32%) and late neonatal deaths (7.6% versus 6.9%), however, a higher proportion of singleton infants experienced stillbirth (61.1% versus 41.4% multiples). A higher proportion of twins were born extremely pre-term ≤ 27 weeks (55.1% versus 31.1%) while a higher proportion of singletons were born between 28-36 weeks (37.2% versus 35% multiples) and > 36 weeks (31.7% versus 9.9% multiples).

Overall, the main cause of death was severe pulmonary immaturity, accounting for 5.5% of all deaths (34.3% versus 11.4% singletons). Multiple pregnancies had higher rates of death due to pulmonary hypoplasia (2.3% versus 0.9%) and pre-viability <22 weeks (12.6% versus 6.7%) but a lower proportion of chromosomal disorders (4.4% versus 10.7%).

Conclusions: This study highlights the importance of ensuring clinical practice with twin pregnancies is adequate and the standardisation of clinical practice is improved so the best evidence-based quality care is provided.

20. Investigation into AAV-BMP2 viral vector as a neurotrophic therapy for Parkinson's Disease

Morales-Prieto N¹, O'Mahony A¹, Collins L², Sullivan A¹, O'Keeffe G¹

¹*Department of Anatomy and Neuroscience University College Cork, ²Department of Physiology University College Cork*

We sought to test the hypothesis that viral delivery of the neurotrophic factor bone morphogenetic 2 (BMP2) to the substantia nigra (SN) would protect dopaminergic neurons from degeneration and motor impairments induced by the overexpression of alpha-synuclein (α Syn) in a rat model of Parkinson's Disease (PD).

To test this hypothesis, adult male and female Sprague-Dawley rats received a unilateral injection of AAV- α Syn to the SN. Four weeks later, they received a unilateral injection of AAV-BMP2 or an AAV-Control vector to the same SN. Behavioural testing (cylinder test) was carried out every 4 weeks before the brains were processed for immunohistochemistry to analyse nigrostriatal integrity at 24 weeks.

Longitudinal behavioural testing revealed that 4 weeks after injection of AAV- α Syn there were significant impairments in contralateral paw use compared to the ipsilateral paw in the cylinder test. This indicated that there was some degree of nigrostriatal damage at the time of AAV-BMP2 delivery. Behavioural testing after viral vector delivery showed significant improvements in contralateral paw use after AAV-BMP2 administration compared to controls. A post-mortem analysis of transgene expression and of nigrostriatal integrity by way of immunohistochemistry is currently underway to determine whether AAV-BMP2 protects the nigrostriatal pathway in vivo. In summary, this is the first report showing that AAV-BMP2 can improve behavioural outcomes in the rat AAV-A53T- α Syn model of PD. Further post-mortem analysis of transgene expression and of nigrostriatal integrity will expand the knowledge of the potential of AAV-BMP2 as an effective therapy for PD.

24. Oral Nutritional Supplements and Dental Health

Coffey N¹, O'Leary F¹, Plant B¹, Roberts A¹, Hayes M¹

¹*University College Cork*

Malnutrition affects >3 million people in the UK, and >33 million people in Europe annually. The majority (93%) are living in the community, with the remaining 7% in care homes and hospitals.

NICE expert guidelines recommend the initiation of Oral Nutritional Supplements (ONS) if patients are malnourished or 'at risk' of malnutrition.

However, these supplements can contain over 34g of sugar per 200ml serving.

Objectives:

1. To list the sugar content of commonly prescribed ONS in the UK and Republic of Ireland
2. To carry out a systematic review into the effects of ONS on the dentition

26. The perceived effects of facemasks on communication in Irish healthcare settings and possible compensatory strategies to overcome these effects.

O'Connor B, Walsh E, Bessell N

Study aims: (1) To examine the impacts of facemasks on communication in healthcare settings across Ireland (2) To determine what compensatory strategies are currently being used by professionals to overcome these effects and (3) to determine which of these compensatory strategies are perceived as most and least effective.

Design: Using a descriptive research design, an online survey consisting of Likert scale questions about the perceived effects of mask use on communication, and open-ended questions about compensatory strategies was distributed to healthcare workers and students throughout Ireland. Sample: 84 participants completed the survey. This included 40 healthcare students and 44 working professionals (HCPs).

Results: With few exceptions, participants felt that facemasks negatively impact communication in the workplace. Aspects affected included understanding, accuracy of information exchange, the quality of therapeutic relationships and expression of emotion. Communication is most impacted with, geriatric populations, children and those with additional needs. The majority of participants felt that the quality of service they provide is negatively impacted by facemasks. Healthcare professionals are currently using a variety of compensatory strategies to overcome these effects. Strategies include speech adaptations, body adaptations, external adaptations and mask substitution or removal.

Conclusions: Irish health care workers indicate that communication in the workplace is negatively affected by facemasks. This illustrates a need for the incorporation of compensatory strategies to overcome these effects. Multidisciplinary training is suggested to allow health care professionals to learn the most effective compensatory strategies for the benefit of their patients.

28. Probiotic supplementation of *B. longum* PSY001 modulates hypothalamic and hippocampal gene expression regulating appetite and satiety

Cuesta-Marti C^{1,2}, Soliz-Rueda J^{1,2,5}, Torres-Fuentes C², Schverer M², Mazzocchi M¹, O'Keeffe G^{1,2}, Dinan T^{2,3}, Cryan J^{1,2,3}, Stanton C^{2,4}, Clarke G^{2,3}, Schellekens H^{1,2}

¹Department of Anatomy and Neuroscience, University College Cork, ²APC Microbiome Institute,

³Department of Psychiatry and Neurobehavioural Science, University College Cork, ⁴Teagasc Food

Research Centre, Moorepark, ⁵Nutrigenomics Research Group, Department of Biochemistry and Biotechnology, Universitat Rovira i Virgili

Microbiota-Gut-Brain axis signalling plays a key role in the regulation of host metabolism and central regulation of appetite. The hypothalamus is a key brain region for the homeostatic regulation of food intake, while the hippocampus plays a key role in cognitive control of eating behaviour and regulation of body weight. Recent literature shows the potential of certain probiotic treatments to improve metabolic and mental health. We aimed to elucidate the potential of *B. longum* PSY001 on the hypothalamic and hippocampal expression of genes involved in the regulation of food intake, appetite, and stress (Oxt, N3cr1, N3cr2, and Bdnf).

We analysed the effects of *B. longum* PSY001 chronic exposure on the expression of key factors in the regulation of stress, metabolism and food intake in 2 independent mice strains, C57BL/6 and the innately anxious BALB/c. Moreover, we investigated whether the PSY001 short exposure (2h) modulates gene expression in hippocampal and hypothalamic immortalized and primary cells.

Remarkably, we found that the hippocampal expression of oxytocin and its receptor was significantly increased by acute exposure to PSY001 in vitro and by the chronic exposure to this probiotic in vivo. Furthermore, PSY001 increased Bdnf, and N3cr1 in the hippocampus of both C57BL/6 and BALB/c mice. Surprisingly, acute exposure to PSY001 modulated the gene expression in vitro, results which were not translated in vivo.

The positive effect of *B. longum* PSY001 in oxytocin expression and other an/orexigenic genes in the hippocampus and hypothalamus might highlight its potential as a treatment for metabolic and neuropsychiatric disorders.

30. Estimating the direct Disability-Adjusted Life Years (DALYs) associated with SARS-CoV-2 (COVID-19) in the Republic of Ireland: The first full year

Moran D¹, Monteiro Pires S², Wyper G², Devleeschauwer B², Cuschieri S², Kabir Z¹

¹University College Cork, ²EU Burden of Disease Task Force

Objectives

Burden of Disease frameworks facilitate estimation of the health impact of diseases to be translated into a single measure, such as the Disability-Adjusted-Life-Year (DALY).

Methods

DALYs were calculated as the sum of Years of Life Lost (YLL) and Years Lived with Disability (YLD) directly associated with COVID-19 in the Republic of Ireland (RoI) from March 01, 2020, to February 28, 2021. Life expectancy is based on the Global Burden of Disease (GBD) Study life tables for 2019.

Results

There were 220,273 confirmed cases with a total of 4,500 deaths as a direct result of COVID-19. DALYs were estimated to be 51,622.8 (95% Uncertainty Intervals [UI] 50,721.7, 52,435.8). Overall, YLL contributed to 98.5% of the DALYs. Of total symptomatic cases, 6.5% required hospitalisation and of those hospitalised 10.8% required intensive care unit treatment. COVID-19 was likely to be the second highest cause of death over our study's duration.

Conclusion

Estimating the burden of a disease at national level is useful for comparing its impact with other diseases in the population and across populations. This work sets out to standardise a COVID-19 BoD methodology framework for the RoI and comparable nations in the EU.

32. Improving the nutritional status of cancer patients: development of free patient resources

Scannell C¹, Hanna M¹, O'Sullivan A¹, Dolan O², Power D³, Ryan A¹

¹*School of Food and Nutritional Sciences, University College Cork*, ²*Breakthrough Cancer Research*,

³*Dept. of Medical Oncology, Mercy University Hospital and Cork University Hospital*

Background: Cancer patients often experience malnutrition and dysphagia which can negatively impact treatment tolerance, quality of life and survival. Few educational patient resources exist to help patients implement a food-first approach.

Methods: Registered dietitians, graphic-designers, food-photographers and dysphagia-chefs were involved in the development of these resources over four years. Energy and protein targets were established using ESPEN guidelines. Dysphagia recipes were developed in line with IDDSI testing methods. Recipes were analysed using Nutritics™. Healthy eating recipes were developed based on World Cancer Research Fund (WCRF) guidelines. Nutrition myths were gathered and scientific rebuttal written. National Adult Literacy guidelines were followed.

Results: A series of 6 free books were developed. 'Good Nutrition for Cancer Recovery is a cookbook for cancer patients with poor appetite/weight loss. 'Good Nutrition for Swallowing Difficulties in Cancer' is a series of 4 texture-modified cookbooks for patients with oesophageal/head/neck cancers. For patients who finished treatment or those with unwanted weight gain, 'Healthy Eating for Cancer Survivors' is based on the WCRF cancer prevention guidelines. Lastly, 'The Truth Behind Food and Cancer' is a booklet providing evidence-based scientific explanations for common fad diets/nutrition myths in cancer (including detoxes, juicing, IV vitamins, alkaline diets). All books were professionally endorsed in Ireland and 40,000 copies were printed and distributed to healthcare settings with sponsorship from Breakthrough Cancer Research.

Conclusion: A food-first approach is favoured by cancer patients. The development of this series of free cookbooks provides dietitians, patients and carers with a valuable educational tool to help meet nutritional requirements.

33. The daily life experiences of UCC doctoral students and how the “Everyday Matters: Healthy Habits for University Life” digital badge impacts daily life and well-being

Prendergast A¹, Usher R², Hunt E³

¹*University College Cork*, ²*University College Cork*, ³*University College Cork*

Background - Poor mental health and well-being among university students, including doctoral students, is a growing concern in Ireland and internationally. Engaging in occupations everyday and maintaining occupational balance is believed to improve health and increase well-being. However, little is currently known about the time-use, daily life, occupational balance and well-being of doctoral students. Whole university approaches to promoting student well-being and success are urgently needed, along a continuum of support including universal, targeted and intensive interventions. “Everyday Matters: Healthy Habits for University Life” is a time-use and well-being universal intervention offered to doctoral students as a co-curricular digital badge microcredential at University College Cork (UCC). Students learn about brain and body health, and how to create and maintain daily habits and routines that support physical and emotional well-being for learning and life.

Method - This is a qualitative interpretive descriptive study. Purposive sampling methods will be used to recruit 8-10 PhD/MD/Practitioner Doctorate students in UCC who completed the “Everyday Matters: Healthy Habits for University Life” digital badge. Data will be generated through individual semi-structured interviews and thematic analysis will be completed. Recruitment is currently underway.

Findings - A person-environment-occupation framework will be used to present the main themes.

Conclusion - Obtaining an insight into the perspectives and experiences of students is essential in order to better understand the students’ experience of their doctoral journey. Furthermore, supporting the mental health of doctoral students through interventions or supports is essential to improve their well-being and assist them in successfully completing their degree.

34. Effects of gut microbiota depletion on anxiety-like behaviour and expression of synaptic proteins in rodent models

Olavarría-Ramírez L^{1,2}, McCafferty C^{2,3}, Murphy G¹, Cryan J^{2,3}, Dockray S¹

¹*School of Applied Psychology, University College Cork*, ²*APC Microbiome Ireland, University College Cork*, ³*Department of Anatomy and Neuroscience, University College Cork*

Anxiety is among the most prevalent psychiatric conditions and there is a pressing need to consider diverse etiologies, and map directions for translational research. Evidence suggests that the gut microbiota, the trillions of microbes living in the gut, can modulate host behaviour, including anxiety-related behaviour. Antibiotics are often used to deplete the gut microbiota to study the role of a changed gut microbiome on behaviour and brain physiology. In this study, we investigated the effects of gut microbiota depletion on anxiety-like behaviour, neuronal activation, and expression of

synaptic proteins in two sets of experiments using rodent animal models. Adult male Sprague-Dawley rats received an antibiotic cocktail (ABX; ampicillin, vancomycin, and imipenem) in drinking water for 4 weeks. ABX rats showed increased anxiety-like behaviour in the open arm of an elevated plus maze compared to the control group. Although the open arm exposure induced a significant increase in neuronal activation in key brain areas linked to stress, no effect of the ABX treatment was observed. The second experiment was performed using male and female adult mice treated with either ABX or vancomycin (Gram-positive targeted antibiotic) for two weeks. Analysis of the protein expression of synaptic proteins in the dentate gyrus and CA1 is currently ongoing by using western blot. Together, these data highlight a role for the gut microbiota in the modulation of anxiety, and the future results of the expression of crucial proteins involved in synaptic activity may shed light into the potential mechanisms by which this modulation may occur.

36. Structural changes and inflammation in the myocardium of a porcine model of metabolic syndrome with HFpEF

Cluzel G¹, Caplice N¹

¹*Centre for Research in Vascular Biology*

Metabolic syndrome (MetS) is a cluster of cardiometabolic risk factors that includes obesity, hypertension, insulin resistance and dyslipidemia. While MetS threatens to overwhelm healthcare services, physicians still lack efficacious therapies for halting disease progression. Notably, patients suffering from MetS are exposed to higher risks of developing potentially fatal cardiovascular diseases such as heart failure with preserved ejection fraction (HFpEF). Inflammatory mechanisms have been demonstrated to play a central role in driving the cardiac structural changes seen in HFpEF. Interestingly, MetS is associated with a chronic inflammatory state that is suggested to promote myocardial inflammation and thus HFpEF. In this context, our team adapted a previously defined porcine model of HFpEF that replicated the human syndrome with systemic and cardiac inflammatory changes that occur in MetS. In this model, MetS induced cardiomyocyte hypertrophy and apoptosis. Gene expression analysis identified signatures of cytokine signalling, inflammatory cells, TLR and NLRP3 signalling, and apoptosis. Additionally, increased numbers of macrophages and T cells were detected by immunostaining. Notably, cardiac macrophage population accounted for up to 20% of total cardiac cells in MetS animals, while T cells were 10 times-less represented. Finally, this model did not fully reproduce the fibrosis component of HFpEF, probably due to a short intervention duration. Overall, pro-inflammatory changes were detected in the myocardium of this porcine model of MetS and HFpEF, along with structural alterations that are known to promote HFpEF. This study further extends the knowledge about cardiac macrophages roles in HFpEF progression.

38. Pursuing People-Centric Research with Family Carers of Dementia through PPI & Research Design

Murphy J¹

¹*University College Cork*

The majority of dementia care is provided by informal caregivers, who often experience significant physical, emotional and economic stress in providing care (World Health Organisation, 2015). This

study aims to reveal the lived experiences of former carers of parents with dementia focusing on their support and education needs and how they perceived these needs were met, from onset to bereavement.

In order to capture participants' experiences, this project used both narrative and semi-structured interviewing. These methods allowed the participants to lead the discussion during the first phase of data collection (narrative) and thus feel in control of the information they chose to share and focus on. This initial phase dictated the course of the second phase of the data collection (semi-structured interviews) and thus kept the person and their experiences at the centre of the research.

A Dementia Advisory Group was assembled to assist in the planning stages of the project and the dissemination of the research findings. This group of family carers provided feedback on the study's aim, design and research materials and also ensured the dissemination of the project was accessible to family carers and the services they use. The Dementia Advisory Group ensured that family carers were not only research participants but also acted as research partners actively contributing to the project through discussion and assisting in research decisions.

This approach ensured the project and its findings were relevant to this population and improved participants' experiences taking part in the research.

39. Oral care for inpatients with dysphagia post stroke; exploring barriers and facilitators

Curtin C¹, Barrett A², Healy L², Hayes M¹

¹Dental School and Hospital, ²Cork University Hospital

Objectives:

It is well established that high quality oral care is important in the overall care of patients who develop dysphagia post-stroke. This qualitative research project aims to explore the barriers and facilitators to carrying out an oral cavity assessment and providing oral care to inpatients with dysphagia on the acute care Stroke Unit of Cork University Hospital.

Methods:

Three focus groups were conducted in the Stroke Unit of Cork University Hospital with a total of seventeen participants. Each focus group consisted of a multidisciplinary group of health professionals currently working on the unit. The focus groups were digitally recorded and professionally transcribed. Transcribed data were analysed by thematic analysis.

Results:

The first theme identified was the importance of oral care. The participants related the importance of this to the prevention of systemic disease, maintenance of dignity and a step towards return to normal living for this group of patients. Themes related to the barriers to providing oral care included a lack of awareness of protocols, time pressures, lack of confidence and lack of specific training in oral care for patients with dysphagia. Themes related to the facilitation of oral care included teamwork and availability of suction and oral care aids.

Conclusions:

Oral care is viewed as an important part of the overall care for patients with dysphagia post-stroke. Multiple barriers exist however to the provision of high-quality oral care for this patient group. Opportunities exist for multidisciplinary interventions to improve the oral care provided on the Stroke Unit.

44. Practice implications from a systematic review on perinatal maternal mental health during COVID-19 lockdowns.

Wall S¹, Dempsey M¹

¹School of Applied Psychology, University College Cork

Poor perinatal maternal mental health can negatively influence infants' psychological wellbeing. Risk factors for poor perinatal maternal mental health are a previous mental health diagnosis; economic concerns; reduced access to perinatal services, and decreased levels of social support. The COVID-19 pandemic posed an additional stressor for perinatal women. To date, no systematic review has focused specifically on the impact of lockdowns during COVID-19 on perinatal maternal mental health. In this systematic review six electronic databases were searched for literature published between 1st January 2020 and 25th May 2021 on the impact of COVID-19 lockdowns on perinatal maternal mental health. Quantitative, peer-reviewed, cross-sectional studies published in English with perinatal women as participants, where data was collected during a period of lockdown, were included. Data was assessed for quality and narratively synthesized. Sixteen articles were included in the final review. Findings confirmed previously acknowledged risk factors for poor perinatal maternal mental health and identified additional variables which may influence perinatal maternal mental health during periods of COVID-19 lockdown. The review highlighted the potential for low-cost preventative formal interventions to support better perinatal maternal mental health. These include perinatal parent-infant art classes, talk therapy, and resilience building interventions such as 'Wellness Recovery Action Plan' (WRAP). Developing resources for perinatal women that integrate informal sources of support may aid them when normal routine is challenged and may mediate potential long-term impacts of poor perinatal maternal health on infants.

47. The Effectiveness of a 26-week Class and Home-based OTAGO Exercise Programme on Self-Reported Balance Confidence and Physical Performance in Older Adults in Ireland.

Curley M¹, Brady S, Tyndall F, McVeigh J, McCullagh R

¹Physiotherapy Department, School of Clinical Therapies, ²Physiotherapy Department, School of Clinical Therapies, University College Cork, ³Physiotherapy Department, School of Clinical Therapies, University College Cork, ⁴Physiotherapy Department, School of Clinical Therapies, University College Cork, ⁵Centre for Gerontology & Rehabilitation, University College Cork

Objectives: Evaluate the effectiveness of a 26-week OEP using a combined delivery approach of physiotherapists and exercise therapists on balance confidence and physical performance. Methods: Study-design: A prospective pre-post single arm intervention study. Older adults (≥ 60 years) were recruited from HSE waiting lists for the OEP which consisted of a group-class (1x/week) and a home OEP (3x/week). Participants were assessed at baseline, 6, 16 and 26 weeks. Outcome measures (OMs) were compared pre and post intervention using Paired T-Tests and Wilcoxon Signed Ranks tests. A repeated-measures ANOVA compared OMs across the time points. Results: Improvements were detected in the CONFbal scale (diff = 2.12, 95% CI=1.353-2.803, $p < 0.01$), 30-second sit-to-stand (diff = 3.49, CI= 2.361-4.201, $p < 0.01$), timed-up and go (diff = 2.38, CI=8.08-12.07, $p < 0.01$), functional reach (diff = 9.158, CI=6.758-11.294, $p < 0.01$), 180° turn (diff = 1.04, CI=3-5, $p < 0.01$), and the four-test balance scale (diff = 0.61, CI=1.0-3.0, $p < 0.01$). Significant changes are noted for each measure ($p < 0.05$) with small-moderate positive effects ($\eta^2 = 0.32-0.512$). The most significant changes in the 180° turn are seen between week-0 (4.92 \pm 1.784) and week-6 (4.44 \pm 1.258) followed by a plateau in results.

Conclusion: Confidence and physical performance improved significantly pre and post intervention, suggesting the physiotherapist and ET combined delivery of the programme is effective. Static and dynamic balance improvements may plateau after 6-weeks of the OEP suggesting the participants may not have been adequately challenged. Lower limb strength and mobility continued to improve throughout suggesting the modified OEP is an effective intervention for older adults in Ireland.

48. An Evaluation of patient experience of virtual telephone consultation for routine diabetes care during COVID-19 and future clinic preference

Lillis S¹, Naughton C¹, Murphy M², Heffernan M²

¹UCC, ²South Infirmary/Victoria University Hospital

Background

The COVID-19 pandemic saw a rapid implementation of virtual clinics to reduce risk of exposure to the virus in outpatient settings. While this was acceptable to patients with diabetes mellitus in the short term, it is unclear how patients feel about virtual clinic substitution as normative practice.

Aim

The aim of this evaluation is to examine the experiences and impact of people with diabetes mellitus switching from face-to-face outpatient clinics to 'virtual clinics' for routine care during COVID-19 pandemic.

Design

This is a cross sectional prospective survey design using postal questionnaires.

Method

The questionnaire containing a CSQ and PEI and some bespoke questions of experience of telephone consultations and future preferences. Patients were recruited from Diabetes outpatient clinic if they had experience of at least one virtual clinic telephone consultation and who also had prior experience of face-to-face consultation.

Results

In total 242 questionnaires were distributed, and 103 were included in the analysis. Over 80% described good or very good outcomes from telephone consultations however only 10% indicated a preference for telephone only consultations to continue. The main reasons given were a lack of personalisation and physical assessments. There was a trend for younger women with Type 1 diabetes to prefer at least some virtual consultation substitution.

Conclusion

The study demonstrated that face-to-face consultations remains a strong preference but there is a place for telephone consultation substitution, particularly with the younger type 1 diabetes population.

49. A Systematic Review and Future Research Agenda: Adolescents' Autonomy Transition to Self-Management of Type 1 Diabetes

Leocadio P¹, Kelleher C¹, Fernandez E¹, Hawkes C², Crowley L²

¹University College Cork, ²Cork University Hospital

Across the whole lifespan, adolescence is the time when diabetes control is worst (Hermann et al. 2020). Although the risk for developing complications appears to be cumulative, periods of poor glycemic control have a detrimental effect termed 'metabolic memory' and focusing on adolescent diabetes care is crucial to reduce complications of this disease at a population level (Nathan et al. 2005, Thomas 2014). This burdensome disease can also be affected by psycho-social factors and stigmatisation, which can create barriers to its successful self-management. However, despite the criticality of adolescent self-management of T1D, the autonomy transition within and beyond the family is not fully understood, in particular from the phenomenological perspective of adolescents (Karlsson, Arman and Wikblad, 2008). The purpose of this systematic literature review is to explore adolescents' with T1D experiences of autonomy transition within and beyond the family, as well as their parents/guardians, siblings, and medical professionals. Using the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Page et al. 2021), a review of peer-reviewed literature in the social science, psychology, and healthcare domains published in English between 2010 to 2021, which evaluated the transition autonomy from the perspective of adolescents with T1D, their families and medical professionals, was conducted. The existing research on autonomy transition, primarily from the medical and psychological domains, has predominantly focused on medical case analysis and outcomes. Critically, the complex lived experience, and social and family contexts which impact adolescents' autonomy transition have been neglected (Wu et al. 2014).

50. Understanding participation in a new online National Diabetes Prevention Programme in Ireland: a mixed methods study with collaboration from academic, clinical and public contributor

Haseldine C¹, Kearney P², O'Donoghue G³, McHugh S⁴

¹*School of Public Health*, ²*School of Public Health*, ³*School of Public Health, Physiotherapy and Sports Science*, ⁴*School of Public Health*

Background

Lifestyle programmes have been shown to be effective at reducing the risk of developing Type 2 Diabetes in those at high risk. However, rates of referral to and participation in the programmes have been low. In Ireland, the HSE has developed a National Programme for Diabetes Prevention. It is being delivered as a pilot online due to Covid 19.

Aim: To assess the reach of and participation in a new online National Diabetes Prevention Programme in Ireland, and to understand experiences of referral and participation.

Methods

Mixed methods data collection includes a postal survey of those invited, assessing reasons for participating (or not). Administrative data will be analysed to calculate uptake (number enrolled in the programme), reach (profile of participants) and retention (sessions completed). Qualitative data will be gathered through focus groups and interviews with stakeholders. The Theoretical Domains Framework and Andersen's Behaviour Model of Health Service Use will guide data collection and analysis.

Results

Preliminary results show 158 people were invited to attend the programme since it started in May 2021 of whom 73 took up the offer (42%). The first cohort (n=21) will complete the programme in June 2022. Descriptive statistics will be used to analyse the quantitative data. Qualitative data will be analysed using the Framework method to identify barriers and enablers to participation.

Conclusion

The findings of this research will inform the design of tailored implementation strategies to scale up the National Diabetes Prevention Programme and will be important internationally for other online health interventions.

51. Exploring Sexual Health Interventions for Women with Breast Cancer: Irish Healthcare Professionals Perspectives

Odowd C¹, Loughman A², Pennisi Y³

¹*Ciara O'Dowd*, ²*Anna Loughman*, ³*Yvonne Pennisi*

Introduction: Sexual health (SH) is a significant predictor of overall health and well-being and is associated with an increased quality of life. Women who undergo breast cancer (BC) treatment are subjected to an array of side-effects which threaten and deteriorate SH. These SH challenges reduce sexual desire and participation in sexual activities, which is linked to a decrease in quality of life.

Literature failed to specify interventions that healthcare professionals (HCPs) use to address these obstacles.

Research Question: Exploring Sexual Health Interventions for Women with Breast Cancer: Irish Healthcare Professionals Perspectives.

Method: A qualitative study, employing a descriptive approach to explore SH interventions with BC patients. Data was collected from ten HCPs through semi-structured interviews, analysed thematically.

Findings: Interventions are used by HCPs to address SH with women who are subjected to BC treatment. Interventions include the use of vaginal moisturisers, lubricants and education on clothing alternatives for body image concerns. However, several barriers are encountered by HCPs due to environmental constraints, personal values and lack of education on SH.

Conclusion: SH is an integral aspect to one's health and well-being and is negatively impacted by BC, yet it is not routinely addressed and is often undervalued by HCPs in practice. Several barriers inhibit the delivery of SH interventions to BC patients. Additional training and education challenging assumptions in relation to SH is required to ensure that the needs of women with BC are met.

54. A qualitative evidence synthesis of parental experiences and perceptions of parent-child interaction therapy (PCIT) for preschool children with communication difficulties

O' Toole C¹, Lyons R², Houghton C²

¹University College Cork, ²National University of Ireland, Galway

Parent-child interaction therapy refers to a number of interventions mediated by trained parents to treat developmental difficulties, including speech, language and communication. Understanding the experiences of parents who take part in parent-child interaction therapy is a key aspect of determining how this intervention can be implemented successfully, but there has been limited work on synthesizing parental views of this intervention. We used qualitative evidence synthesis which involved searching the literature for qualitative studies addressing the experiences and perceptions of parent-child interaction therapy for parents of preschool children with communication difficulties. We identified 28 studies (from 32 publications) and synthesized the data using thematic synthesis. We appraised the quality of included studies using CASP and assessed our confidence in the review findings using GRADE CERQual. Results showed that at the beginning of this intervention parents may have competing demands and varied expectations about the intervention. Their engagement is facilitated when the intervention is tailored to their individual family, their preferences for learning and when they have a trusting relationship with the clinician. At the end of the intervention, although most parents perceive an improvement in their child's communication and feel empowered to facilitate this, they have concerns about their child's future needs. It is important that clinicians explore parents' readiness for this intervention by discussing their needs and preferences openly, and that they facilitate their engagement through a supportive relationship. They also need to consider how parents will transition out of the intervention and continue to support their child's language development.

59. A multi-national survey of learning needs in healthy and active ageing as rated by potential students, employers, academics and key stakeholders

Wiggin D¹, Mali J², Filipovič Hrast M³, Setti A⁴, Stitzel A⁵, Ströckl D⁶, Kuisma R⁷, Baptista F⁸, Zymbal V⁸, Cardadeiro G⁸, Nevala E⁷, Sourtzi P⁹, Timmons S¹

¹*Centre for Gerontology and Rehabilitation, School of Medicine, University College Cork*, ²*Faculty of Social Work, University of Ljubljana*, ³*Faculty of Social Sciences, University of Ljubljana*, ⁴*School of Applied Psychology, University College Cork*, ⁵*Faculty of Health Care and Social Services, Carinthia University of Applied Sciences*, ⁶*Institute for Applied Research on Ageing, Dep. Health and Assistive Technologies, School of Medical Engineering, Carinthia University of Applied Sciences*, ⁷*Karelia University of Applied Sciences*, ⁸*CIPER, Faculdade de Motricidade Humana, Universidade de Lisboa*, ⁹*Department of Nursing, Laboratory of Prevention, National and Kapodistrian University of Athens*

Introduction: Healthy and active ageing and age-friendly society frameworks offer to address the challenges of an ageing European society. This study identified related learning needs, as perceived by multiple stakeholders, to inform an online EU-based master's.

Methods: An anonymous online survey collected data in Austria, Finland, Greece, Ireland, Portugal, and Slovenia, from senior undergraduates and recent graduates across disparate courses; future employers; relevant academics; and other key stakeholders (e.g. advocacy groups and 'expert' older people serving on relevant committees). Using a Likert scale, participants indicated the importance of 14 knowledge areas, identified from a literature search and informal consultation with academics and older people.

Results: In the 757 surveys included in the final analysis, academics, potential students, and other stakeholders were evenly balanced; potential employers were difficult to reach. Within the presented topics, psychological aspects of ageing, health promotion, and social inclusion were deemed important by >90% of respondents. In descending order, physiological ageing; human rights; social aspects of ageing; age-friendly workplace and transition to retirement; physical environment and ageing; technology and ageing; older people and education; transferrable skills; policy; interprofessional learning and working; and climate action and ageing, were next-ranked. Participants suggested health care/services; psychopathology; sexuality and relationships; and chronic illnesses be included in the programme.

Key conclusions: Educational offerings should be underpinned by learning needs and preferences. This study presents the learning needs/preferences in healthy and active ageing of key stakeholders in six European countries. The findings can inform the development of future educational programmes on this theme.

61. Bringing Therapy Home: Exploring parents' experiences of telehealth for children with Developmental Coordination Disorder

Bourke A¹, O Connor U, Boyle B, Kennedy J

¹*University College Cork*

Introduction

Developmental Coordination Disorder (DCD) significantly impacts a child's motor skills and ability to learn and perform self-care and academic tasks. Telehealth is a rapidly emerging service delivery model, ensuring expanded access to services and continuity of care. Many benefits to the use of telehealth have been identified, yet there is a dearth of published evidence available on the experiences of parents of children with DCD.

Aim

The aim of this study was to explore parents' experiences of implementing a telehealth motor-skills programme for their child with DCD.

Method

This study utilised a qualitative descriptive approach to best capture parents' experiences of a telehealth programme. Data was collected through in-depth, semi-structured interviews with eight participants and analysed using thematic analysis. Measures to ensure the trustworthiness of the study were observed within the naturalistic paradigm comprising criteria of credibility, transferability, dependability and confirmability.

Findings

This study uncovered three major themes: 1) Parents in the Dark, 2) Telehealth in the Family and 3) Telehealth: What Success Looks Like. Ten further sub-themes highlighted factors for success and parents' considerations for future service delivery.

Conclusion

Challenges for parents in accessing traditional occupational therapy services presents an opportunity to explore alternative means of delivery such as telehealth. Parents however are clear in their preference for a blended approach for future services.

63. Behaviour change interventions for physical activity in adults with chronic obstructive pulmonary disease (COPD); protocol for a systematic review

Hanrahan C¹, Broderick J², O'Connor T³, McVeigh J¹

¹University College Cork, ²Trinity College Dublin, ³Mercy University Hospital

Title;

"Behaviour change interventions for physical activity in adults with chronic obstructive pulmonary disease (COPD); protocol for systematic review"

Introduction

Engaging people with COPD in physical activity is challenging. Supporting positive behaviour change in people with COPD could help to increase their engagement with physical activity. This systematic review will examine behaviour change interventions for physical activity delivered to community dwelling adults with COPD. Interventions will be mapped against Michie's Theoretical Domains Framework.

Methods

The following eight databases were searched from inception until February 2022:

Web of Science, CENTRAL, MEDLINE (via EBSCO), EMBASE, APA PsychINFO, CINAHL (via EBSCO), PROSPERO, Cochrane Airways Trials Register. Grey literature will be searched using Grey Literature Report, Open Grey and Google Scholar search engines.

Relevant studies are being systematically reviewed and will be subject to quality appraisal to determine the impact of behaviour change interventions on physical activity outcomes in adults with COPD. Interventions will be mapped to Michie's TDF and a narrative synthesis with respect to nature, effectiveness on target population and setting/environment will be provided. The review will be presented according to the PRISMA guidelines 2020.

Results

Thirteen studies met the inclusion criteria and are included for systematic review.

Conclusions

This systematic review will consider behaviour change interventions for community dwelling adults with all stages of COPD and their impact, if any, on levels of, or engagement with physical activity.

65. Survival and morbidity of Very Low Birth Weight Infants in Ireland: 2015-2019

Leitao S¹, Corcoran P¹, Murphy B³, Twomey A², Greene R¹

¹*National Perinatal Epidemiology Centre, UCC*, ²*National Maternity Hospital*, ³*Neonatology, University Hospital Waterford*

Background

The Vermont Oxford Network (VON) maintains information regarding care and outcomes of very low birth weight (VLBW) infants (i.e. infant born alive with birth weight between 401-1500 grams OR gestational age between 22-29 weeks) from over 1300 neonatal intensive care units globally. This data allowed to assess whether infants born in Ireland in 2014-2019 had a higher than expected risk of death or morbidity.

Methods

Since 2014, all 19 Irish neonatal units contributed data to VON. VON uses multivariable logistic regression models to quantify the mortality risk associated with various infant characteristics. We used coefficients from these models to calculate standardised mortality ratios (SMRs).

Results

Data on 3462 VLBW infants born in Ireland (2014-2019) were available. The mortality risk in 2019 was consistent with previous five years: 21% higher than expected after adjusting for the risk profile of the population (SMR=1.21; CI 0.34, 1.47).

Infants born at 24-27 weeks in tertiary units did not experience higher mortality risk (SMR=1.01, 95% CI: 0.80, 1.23); those born in non-tertiary units (regional/peripheral) had a 70% higher risk (SMR=1.70, 95% CI: 1.25, 2.15).

ROI Infants continue to show a statistically higher rate of pneumothorax compared to VON (SMR=1.97; CI 1.51, 2.44), a consistent finding since 2014.

Conclusions

These findings support and highlight the importance of the existing Model of Care recommendations: administering resuscitation to all infants born at 23 weeks in favourable condition; infants born <28 weeks of gestation should be delivered in tertiary centres. Further analyses should examine the increased pneumothorax rate.

66. Living with Endometriosis: A qualitative exploration of women's perceptions and experiences of diagnosis, supports and treatment options in Ireland.

Lightbourne A¹, Cronin M², Foley S³, Dempsey M⁴

¹University College Cork, ²University College Cork, ³University College Cork, ⁴University College Cork

Background: Endometriosis is an incurable chronic condition associated with debilitating pain and subfertility, which affects over 155,000 women in Ireland, for whom diagnosis may take up to nine years. In March 2022, the Department of Health launched the first Women's Health Action Plan 2022-2023, which includes the establishment of two specialist endometriosis services nationally. This study, undertaken in 2021, examined the perceptions and experiences of women with endometriosis regarding the diagnosis, support and treatment options available in Ireland with a view to informing health service development.

Methodology: A qualitative study design with purposeful recruitment strategy was adopted. Twenty semi-structured, online interviews with women with a medical diagnosis of endometriosis and experience of the Irish healthcare system were completed. The data was analysed thematically using Reflexive Thematic Analysis.

Results: Four themes were identified in the data: (1) dismissive / unsupportive attitudes which discouraged women from engaging with healthcare, (2) lack of knowledge and education among general practitioners and women with symptoms, (3) delayed diagnosis and (4) inadequate specialist health services. Findings highlight the varied and protracted routes to diagnosis and treatment experienced by participants, and their medical and embodied knowledge of the condition and health service pathways.

Conclusions: This timely qualitative study presents the experiential insights of 20 women with endometriosis. It recommends the development of specialised centres for endometriosis diagnosis and management in Ireland, adoption of patient-centred multidisciplinary models of care, reduction in time to diagnosis and increased endometriosis education and awareness for healthcare practitioners, patients, and the public.

68. Practice Enhancement for Exclusive Breastfeeding (PEEB): Women and Partners' Self-Reported Breastfeeding Attitudes and Self-efficacy

Leahy-Warren P¹, O'Driscoll M¹, Lehane E¹, Buckley C^{1,2}, Cogan L^{1,3}, O'Connell R¹, Murphy M¹, O'Connor S³, O'Sullivan M³, O'Connor M^{1,3}, Mulcahy H¹

¹School of Nursing and Midwifery, Brookfield Health Sciences Complex, ²Northridge House Education and Research Centre St. Luke's Home, ³University Hospital Kerry Maternity Services

Background:

Rates of exclusive breastfeeding in Ireland remain amongst the lowest in Europe, despite its health, economic and environmental benefits. Inclusion of women and partners as key stakeholders in breastfeeding promotion is recognised as improving exclusive breastfeeding rates and reducing the occurrence of lactation problems.

Aim:

To investigate the self-reported breastfeeding attitudes and self-efficacy of women and partners antenatally, in order to inform future breastfeeding supports.

Methods:

Women and partners attending University Hospital Kerry Maternity Services for a booking appointment at twelve weeks gestation who intend to breastfeed were recruited from October 2021 – April 2022 following ethical approval. Women completed a baseline survey package: the Prenatal Rating of Efficacy in Preparation to Breastfeed Scale, demographics and the Iowa Infant Feeding Attitude Scale (IIFAS). Partners completed the latter two questionnaires. Data were analysed using descriptive and inferential statistics. Follow-up is ongoing at 36 weeks gestation, 6 weeks post-partum and three months post-partum.

Findings:

Findings to date demonstrate that both women and partners exhibit a neutral attitude towards breastfeeding in early pregnancy. Women scored moderately highly in prenatal breastfeeding self-efficacy. Additional findings from the 36 week follow up will also be presented.

Conclusions:

Results of this study suggest the need for a public health approach to changing attitudes and raising greater awareness and knowledge of breastfeeding to ensure the right support at the right time for women and their families to successfully breastfeed their infants.

69. Podiatrists' experience of implementing a National Model of Care for The Diabetic Foot

Pallin J¹, Buckley O'Farrell K¹, O'Neill K¹, Riordan F¹, McHugh S¹, Dinneen S², Buckley C¹, Kearney P¹
¹University College Cork, ²Centre for Diabetes, Endocrinology and Metabolism

Background: In 2011, the Model of Care (MOC) for the Diabetic Foot was published, outlining the role for acute and community podiatrists in the management of the foot and the role of GP practices in screening and management of low-risk patients. This study aimed to explore podiatrists' work activities, links within, and satisfaction with, primary and secondary care, and their experiences of implementing the MOC.

Methods: A cross-sectional online survey of podiatrists working across HSE acute and community settings was conducted between October 2017 and April 2018. It was comprised of closed and open-ended questions. Quantitative results were analysed using descriptive statistics. Open-ended responses were analysed using content analysis.

Results: There was a response rate of 79% (n=51). Twenty-four (47%) podiatrists worked in the acute setting, nineteen (37%) in the community setting and eight (16%) across both settings. There was a high demand on podiatry services across both settings, contributing to non-fulfilment of key aspects of the MOC, such as management of moderate and high-risk patients, and provision of rapid access services. Responses from community podiatrists indicated dissatisfaction with activities such as GP screening and acute podiatrists' failure to see those with active-ulceration within the recommended 24-hour timeframe. Reported challenges in the implementation of the MOC included lack of podiatry managers, lack of awareness of the role of podiatry and lack of podiatrists.

Conclusion: This evaluation identifies gaps and challenges which need to be considered in the implementation of the new 2021 MOC and prevent the same problems from persisting.

71. The “How” of conducting impactful Virtual Focus Groups during a pandemic

Twomey M¹

¹Health Innovation Hub Ireland

This paper reports on the reflection of the Clinical Evaluation Manager in the Health Innovation Hub Ireland, and aims to portray his real-life experience of conducting virtual focus groups during the Covid 19 pandemic in order to help health companies/individuals evaluate minimal viable products (MVPs) with clinical experts, with particular emphasis on the pros and cons of such virtual encounters and how these may be overcome via a novel design process.

Using Driscoll's model of reflection, a real-life unsanitized experience is carefully imparted via a series of 4 vignettes, including a number of key learnings, which highlight the connection between a meticulous human centred designed approach to virtual clinical evaluations, and truly effective outcomes.

By providing this rich account of virtual focus groups, it is hoped that this reflection will help others to better understand the complexity of virtual feedback sessions; to avoid making assumptions and becoming fixated on obstacles; and to move instead to an end point where new ways of evaluating a solution virtually have been considered, explored, and understood—an end point where successful end results are reached through grit and determination.

This paper advocates for the inclusion and portrayal of the actual realities or ups and downs of virtual focus groups conducted during the Covid 19 pandemic, capturing the often-tacit knowledge of such encounters and begetting a sense of realism and humanity to these virtual feedback sessions serving as knowledge contributions in their own right.

73. In silico assembled Non-human primate bacteriophage genomes: Real or Unreal?

Throne C, Lavelle A, O'Leary D, Molloy S, Fanning L¹

¹ucc

Background: Bacteriophages, or phage, are a category of viruses found in all environments of the world and predominantly prey on bacteria albeit certain species that can infect an archaea host. Because of these factors, a vast array of completely unknown and unique genetic material exists within the genomes of viruses, which has been termed as biological "dark matter". Five new phage genomes, existing within the viromes of four non-human primates: chimpanzees, gorillas, gibbons, and orangutans, were sequenced, reassembled and characterised in silico using various bioinformatic tools. The purpose of this research was to attempt to shed light on this vast "dark matter".

Results: The five phage genomes were fully sequenced. Characterisation of the genomes via application of ORF function and predicting phylogeny varied greatly, with one virus in particular exemplifying this idea of "dark matter" sequences as most of its genome shares nothing in common with previously published viruses. The four other viruses were phylogenetically characterised to a family level, with three appearing to be members of the Microviridae family and one appearing to be a member of the Siphoviridae family. Subsequent selection pressure analyses showed interestingly how certain genomic regions show high levels of conservation in chimpanzees and orangutans, but not in gibbons, indicating potential quasi-species formation.

Conclusion: The re-assembly of the genomic sequences for these viruses addresses the real or unreal question. Validating further the bioinformatics pipeline. Overall, our research enriches the data available on the bacteriophage world by characterising five new phage.

76. The small molecule class IIa HDAC inhibitor TMP269 protects against degeneration in in vitro models of Parkinson's Disease

O'Mahony A¹, Collins L^{1,2}, Sullivan A^{1,3}, O'Keeffe G^{1,3}

¹Department of Anatomy and Neuroscience, ²Department of Physiology, ³Parkinson's Disease Research Cluster (PDRC)

Parkinson's disease (PD) is the second most common neurodegenerative disease globally, characterized by midbrain dopaminergic (mDA) neuronal degeneration leading to motor impairments. The main pathological hallmark of PD is overaccumulation of the protein α -synuclein in Lewy bodies and Lewy neurites. There is no disease modifying therapy for PD, thus, identification of new therapies that protect and/or regenerate dopaminergic neurons is essential.

Epigenetic modifications, specifically alterations in histone acetylation levels by histone deacetylases (HDACs) are associated with progression of PD pathology. This has led to consideration of HDAC inhibitors (HDIs) as potential disease-modifying therapies for PD.

For this reason, we investigated the potential of a class-IIa specific HDAC inhibitor called TMP269, as a potential neuroprotective agent. We hypothesised that TMP269 would protect mDA neurons against neurotoxin-, or α -synuclein- induced degeneration. To test this hypothesis, we used SH-SY5Y cells, a widely-used model of human mDA neurons. Cells were treated with 5 μ M of the dopaminergic neurotoxin, 6-hydroxydopamine (6-OHDA) along with 0.1 μ M of TMP269 daily for 72h, or transfected to overexpress the wild-type α -synuclein (WT-SNCA) protein, then treated with 0.1 μ M TMP269 daily for 72h. TMP269 treatment significantly increased neurite outgrowth in 6-OHDA treated cells ($p < 0.01$), and protected against 6-OHDA-induced degeneration ($p < 0.01$).

TMP269 also protected SH-SY5Y cells against WT-SNCA-induced neurite degeneration ($p < 0.0001$). Additionally, TMP269 treatment was found to have no adverse effects on cellular viability. In summary, our data highlights the neuroprotective effects of TMP269 in in vitro models of PD, an important first step in evaluating its potential as an effective therapy for PD.

80. A Bioinformatics Approach Highlights the Potential of Retinoids in Glioblastoma Growth Regulation.

Flynn P¹, Jansen M³, Bermingham N³, Hand C², Toulouse A¹

¹*Dept of Anatomy & Neuroscience, University College Cork*, ²*Dept of Pathology, University College Cork*, ³*Dept of Neuropathology, Cork University Hospital*

Glioblastoma is the most diagnosed brain cancer in Ireland, with an annual incidence of 8/100,000. The prognosis is poor, 95% of patients die within 2 years. Current treatment options typically involve radiotherapy and chemotherapy.

Retinoic acid and its synthetic analogues, the retinoids, are potent lipophilic differentiation agents and are considered as potential adjuvant therapy to trigger the terminal differentiation of glioma cells. Retinoids act on a pathway including the nuclear retinoic acid receptors (RARs) that stimulate the expression of target genes. Three genes exist for RARs (RARA, RARB, RARG), each encoding multiple functional isoforms differing in the N-terminus active-protein domain.

Previous studies using RA to treat glioblastoma have reported mixed outcomes. This may be due to the use of pan-RAR ligands which does not discriminate between isoforms. We propose that, as observed in other cancers, different isoforms exert differing effects on glioblastoma cell growth. This study aims to explore the expression of the genes in the RA pathway to identify changes associated with advanced tumours.

Expression values for genes in the RA pathway were obtained from published microarray data of glioma and control samples. Data analysed according to histological types and grade indicate that availability of RA may be hampered as glioma progresses, potentially in a grade-specific and cell-origin dependent manner. Understanding the functional status of the RA pathway in glioma with the knowledge of specific RAR-isoform mediated growth effects may identify targeted treatment options.

81. Functional analysis reveals ZNHIT1 as a promoter of BMP-Smad signaling and a novel target for neuroprotection against alpha-synuclein-induced impairments in Parkinson's disease.

McCarthy E¹, Anantha J¹, Morales-Prieto N¹, Collins L^{1,2,4}, O'Keeffe G^{1,3,4}, Sullivan A^{1,3,4}

¹*Department of Anatomy and Neuroscience, University College Cork, Cork, Ireland*, ²*Department of Physiology, University College Cork, Cork, Ireland*, ³*APC Microbiome Ireland, University College Cork, Cork, Ireland*, ⁴*Parkinson's Disease Research Cluster (PDRC), University College Cork, Cork, Ireland*

Parkinson's Disease (PD) is neurodegenerative disorder whose pathological hallmarks include the progressive degeneration of dopaminergic neurons of the substantia nigra, and intracellular inclusions of aggregated α -synuclein (α Syn). Our previous work has shown that transcriptional regulator Zinc Finger HIT-Type Containing 1 protein (ZNHIT1) is co-expressed with α Syn in the human substantia nigra, and that it protects against α Syn-induced impairments in neurite growth and cell viability in vitro. However, the molecular mechanisms underlying this effect are unknown. We hypothesised that ZNHIT1 protects against α Syn-induced impairments in neurite growth and cell viability through activation of the BMP-Smad pathway, which is known to be neuroprotective. To test this, SH-SY5Y cells, commonly used as models of dopaminergic neurons in vitro, were transfected with 500 ng FLAG-tagged ZNHIT1 together with GFP or α Syn-GFP. Luciferase activity, protein expression, neurite length (as a single cell readout of neuroprotection) and cell viability (by LDH assay) were assessed at 72 h. Luciferase assay revealed that ZNHIT1 promoted BMP-Smad-dependent transcription, and that this effect was inhibited by α Syn. Immunocytochemistry confirmed nuclear expression of ZNHIT1. Densitometry revealed that BMPR inhibition did not alter cellular levels of ZNHIT1. Neurite length and cell viability analyses showed that the neurite growth-promoting effects of ZNHIT1 in α Syn-overexpressing cells were abolished by the BMP receptor inhibitors Dorsomorphin and K02288. These data show that the neuroprotective and growth-promoting effects of ZNHIT1 may be due to upregulation of BMP-Smad signalling, which is impaired in cells overexpressing α Syn. This rationalises further investigation of the role of ZNHIT1 in PD pathology.

82. Retrospective review of bone health status, management and treatment of low bone mineral density of the Cystic Fibrosis adult population attending Cork University Hospital

Rowe R¹, Howlett C², Cronin K², Vagg T^{2,3}, Plant B^{2,3}, Cushen S¹

¹*School of Food and Nutritional Sciences*, ²*Cork Adult CF Centre*, ³*HRB Clinical Research Facility*

Background- Due to improvements in the clinical care of people with Cystic Fibrosis (CF), there is an increased expected survival, which has led to an increase in the prevalence of long-term complications of CF. Adults with CF have many risk factors for reduced Bone Mineral Density (BMD). The aim of this retrospective study was to determine the prevalence of reduced BMD in the adult CF population attending Cork University Hospital (CUH), assess risk factors for low BMD and compare current practice to CF guidelines.

Methods- All adults attending the CF unit in CUH were invited to participate in this study. Data was collected on two previous DEXA scans, biochemistry results, supplementation, current exercise and medications.

Results- 61 out of 169 patients (36.1%) had moderately reduced BMD (Z-score between -1 and -1.9 or T-score between -1 and -2.4). 25 patients (14.8%) had CF related low BMD, (Z-score \leq -2 or T-score \leq -2.5). The prevalence of CF related low BMD was significantly higher in patients with CF Related Diabetes (CFRD). 26.9% of patients had their most recent DEXA scan completed within the last two years compared with 48.1% prior to the covid pandemic.

Discussion- Our findings reported a lower prevalence of low BMD than other studies which is likely due to improvements in the care of people with CF. Optimising glycaemic control in patients with CF may help in the management of bone health. Further research into the impact of CFTR modulators on CF related bone disease will be of value.

83. Impact of CFTR triple combination modulator therapy (Kaftrio) on body composition in adults with Cystic Fibrosis

Mulcahy K¹, Howlett C², Cronin K², Vagg T^{2,3}, Cushen S¹, **Plant B^{2,3}**

¹*School of Food & Nutritional Sciences, University College Cork*, ²*Cork Adult CF Centre, Cork University Hospital, University College Cork*, ³*HRB Clinical Research Facility Cork, University College Cork*

Background

Phase 3 clinical trials have shown that people with Cystic Fibrosis (CF) can gain weight on commencing Kaftrio®. However, the effect of Kaftrio® on body composition over time remains incompletely described.

Methods

A retrospective analysis of all eligible patients on Kaftrio® in Cork University Hospital was conducted. The study variables included weight, Body Mass Index (BMI), and body composition (including Fat-Free Mass (FFM) and Fat Mass (FM)). Longitudinal changes in body composition were examined using a multi-frequency segmental analyser at 0 (pre-Kaftrio), 3, 6, 9 and 12 months.

Results

100 patients were included. Mean BMI was 22.96kg/m² ± 3.13 pre-Kaftrio. After 3 months weight increased by +2.52kg (P<0.001), BMI by 0.96kg/m² (P<0.001), FFM by 1.16kg (p<0.001) and FM by 1.56kg (P < .05). From 3-6 months there were further increases in weight (+0.83kg), BMI (0.31kg) (P<0.05). Beyond 6 months, results began to plateau. Between baseline and 12 months, the total weight gain was 5.09 kg (P<0.001), comprising of 1.68kg FFM (P<0.001) and 3.41 kg FM (P < .05).

Conclusion

Changes in body composition are significantly associated with Kaftrio® in the first 3 months of treatment, with smaller gains observed between 3 and 6 months for weight and BMI. Only 20 patients have completed a full 12 months of Kaftrio treatment to date so further ongoing analysis is underway to assess these body composition changes.

84. Individualized approach to elxacaftor/ tezacaftor/ ivacaftor dosing in cystic fibrosis.

IBRAHIM H^{1,2}, DANISH H¹, MORRISSEY D^{1,2}, Twohig S¹, Fleming C¹, McCarthy M¹, Dorgan J¹, Murphy D^{1,2}, Maher M^{1,2}, Plant B^{1,2}

¹*Cork Adult CF Centre, Cork University Hospital, University College Cork*, ²*HRB Clinical Research Facility Cork, University College Cork*

The prevalence of mental health disorder is higher in people with Cystic Fibrosis (CF). Mental health and neurocognitive adverse-events have been reported in real-world studies of all available CFTR-modulators. Our real-world experience of mental health adverse-events appear to be higher after initiation of elxacaftor/tezacaftor/ivacaftor compared to other CFTR-modulators.

A small group of our patients (9 patients/ 7.26% of patients on elexacaftor/tezacaftor/ivacaftor) developed self-reported worsening anxiety, irritability and/or mental slowness shortly after initiation of full-dose treatment, despite improvements in a mean ppFEV1 of 13.9 points compared to baseline ($p=0.0164$), and mean of difference in sweat chloride was -39.3mmol/L . We adopted a dose reduction approach in this group to facilitate continuing CFTR modulation therapy, while attempting to minimize self-reported side-effects. Elexacaftor/tezacaftor/ivacaftor dose reduced to one tablet (75/50/100mg) daily. Subsequently, we gradually increased the dose every 6 weeks, and considered returning to full dose pending resolution of self-reported mental/psychological symptoms at 12 weeks, whilst simultaneously monitoring change in FEV-1 and sweat chloride to ensure sustained clinical effectiveness.

Dose reduction resulted in resolution of self-reported mental/psychological side-effects, while their clinical parameters were comparable to their data on original full dose (mean ppFEV-1 83.4% on reduced dose compared to mean ppFEV-1 of 80.3% on full standard dose, and mean sweat chloride was 32.2mmol/L and 33.4mmol/L on reduced dose and full dose, respectively).

Our approach suggests that it may be feasible and important to reduce treatment dose to alleviate side-effects, without loss of clinical effectiveness, though prospective monitoring to ensure sustained benefits will be required.

87. Influence of Antibiotic Chemistry on Paediatric Patient Acceptability

Elgammal A^{1,2}, Ryan J³, Bradley C³, Crean A², Bermingham M¹

¹Pharmaceutical Care Research Group, School of Pharmacy, University College Cork, ²SSPC Pharmaceutical Research Centre, School of Pharmacy, University College Cork, ³Department of General Practice, School of Medicine, University College Cork

Background: Palatability is 'the overall appreciation of a medicinal product in relation to its smell, taste, aftertaste, and texture (i.e., feeling in the mouth)' and is a key element of paediatric acceptability for oral medicinal products. Oral liquid antibiotics with poor palatability may cause treatment failure and increase risk of antimicrobial resistance because of refusal by children.

Aim: This study aim was two-fold. Firstly, to understand the issues related to palatability of oral liquid antibiotics associated with the dispensing of oral liquid antibiotics by pharmacists, and identify methods employed to overcome these challenges. Secondly, to establish a gas chromatography-mass spectrometer (GC-MS) method to identify the volatile components associated with the malodour of flucloxacillin formulations.

Methods: An online questionnaire was disseminated to community pharmacists in Ireland in November 2021. GC-MS analysis of flucloxacillin drug and commercial formulations was carried out using a headspace sampler.

Results: Responses from 184 community pharmacists were analysed. Respondents identified poor palatability of oral liquid antibiotic products through parent/caregiver feedback (95.7%, $n=176$). Most respondents (82.3%, $n=149$) reported that mixing with food or diluting in a flavoured liquid,

was the most common advice given to a parent/caregiver unable to administer an unpalatable oral liquid antibiotic. Clarithromycin (31.5%, n=58) and flucloxacillin (28.8%, n=53) were reported as the least palatable oral liquid antibiotics. GC-MS analysis identified two volatile compounds associated with flucloxacillin.

Conclusion: Community pharmacists reported that malodour of oral liquid antibiotics influences prescribing and dispensing practices. GC-MS analysis identified volatile compounds that may be associated with the malodour.

89. A study on the co-design of a Speech and Language Therapy app for Individuals with Parkinson's disease.

Meskill C¹, Kelly H¹

¹Speech and Hearing Sciences, School of Clinical Therapies

Parkinson's disease is the fastest growing neurodegenerative disease worldwide with up to 90% of patients experiencing changes to their voice. Changes to the voice can have a significant impact on patients' participation in social situations, thus impacting their quality of life. This includes communicating with family members, friends and unfamiliar communication partners including healthcare professionals. Speech and language therapists can help minimise and manage the impact changes to voice has on the quality of life for patients. However, in-person, one-to-one therapy is not always sustainable for long-term management, which leads to the movement to technology-based intervention and self-management.

Aims: The purpose of this co-design study is to identify the components of an ideal speech therapy app from the perspectives of individuals with Parkinson's Disease and speech and language therapists who work with this population through interviews and focus groups. Specifically, to a) explore the experiences, barriers, and facilitators in using technology by individuals with Parkinson's disease from the perspectives of individuals with Parkinson's Disease and speech and therapists, (b) define user-friendly elements in a software app from the perspectives of individuals with Parkinson's disease, and c) explore the experience of Individuals with Parkinson's Disease in participating in this co-design process.

Method: People with Parkinson's Disease and Speech and Language Therapists will participate in separate small focus groups or semi-structured interviews. This data is currently being analysed using Thematic Analysis and will be presented at the conference.

93. Delivery of antisense oligonucleotide using cyclodextrin-based nanoparticles: an effective Huntingtin lowering approach

Mendonca M¹, Cronin M¹, Milanga M², Cryan J³, O'Driscoll C¹

¹School of Pharmacy, University College Cork, ²Cyclolab (last affiliation), ³APC Microbiome Ireland/Department of Anatomy and Neuroscience, University College Cork

Huntington's disease (HD) is an autosomal dominant neurodegenerative disease caused by a CAG repeat expansion in the huntingtin gene (HTT), which codes for the toxic mutant HTT (mHTT) protein. Currently, there is no cure for patients with HD. However, mHTT lowering strategies have shown promising results. Here, we designed and synthesized cyclodextrin (CD)-based nanoparticles loaded with antisense oligonucleotides (ASOs) targeting HTT. The CDs:ASO nanocomplexes were tested for allele-selective repression of HTT in GM04723 (CAG15/67) patient-derived fibroblasts using a single-nucleotide polymorphism (SNP)-specific RT-qPCR assay for rs362307 (SNP1), which is present in two-thirds of HD patients with European ancestry. CDs enhanced ASO cellular uptake by ~62% compared to free ASO, as evidenced by flow cytometry. Both β -CDs and γ -CDs (double-charged chain) were able to repress the HD-causing alleles. The maximum response was achieved following 72 h treatment with γ -CDs (100 nM ASO per well), where SNP1 mRNA levels decreased to 59% ($p < 0.05$). CDs were well tolerated by the fibroblasts with cell viability (assessed by CellTiter-Fluor™) higher than 90% relative to untreated cells. Regarding the physicochemical profile, the Z-average diameter of CDs:ASO nanocomplexes was less than 180 nm with a polydispersity index < 0.3 and a slightly positive surface charge (15 mV). The gel retardation assay confirmed that all CDs strongly bound the ASO at a mass ratio of 10:1. Overall, the data demonstrate that CD-based nanoparticles carrying ASO could be a promising therapeutic approach for the safe and effective lowering of mHTT.

94. Mitochondrial dysfunction drives a dysregulated inflammatory response in gestational diabetes mellitus

McElwain C¹, Musumeci A¹, Manna S^{1,2}, McCarthy F², McCarthy C¹

¹*Department of Pharmacology and Therapeutics, School of Medicine, Western Gateway Building, University College Cork,* ²*Department of Obstetrics and Gynaecology, Cork University Maternity Hospital*

Problem: To determine if mitochondrial dysfunction orchestrates an altered immune response in Gestational Diabetes Mellitus (GDM).

Methods: Circulating cell-free mitochondrial DNA (mtDNA) was quantified from GDM (n=20) and healthy pregnant control participants (n=20) by quantitative PCR analysis. Inflammatory cytokines in placental explant culture supernatants (n=10 GDM and n=10 control) and maternal plasma (n=20 GDM and n=20 control) were quantified using LEGENDplex ELISA. NLRP3 protein levels were measured in GDM (n=8) and control (n=8) placental tissue. Flow cytometry was used to investigate circulating, placental and omental macrophage polarisation and mitochondrial superoxide production in GDM (n=7) and control (n=8) participants. Statistical analysis was performed with GraphPad Prism 8.

Results: Relative circulating mtDNA levels were significantly higher in GDM vs. control (109233 copies/ μ l \pm 111578 copies/ μ l vs. 16657 copies/ μ l \pm 18740 copies/ μ l, $p=0.002$). Circulating CD14+CD206+ M2-like monocytes/macrophages produced significantly higher levels of mitochondrial superoxide in GDM compared to control (49.07% \pm 13.19% vs. 26.29% \pm 20.15%, $p=0.03$). Circulating levels of IL-6 ($p=0.003$), IL-12p70 ($p=0.05$) and MCP-1 ($p=0.03$) were significantly increased in GDM.

Elevated levels of IL-18 ($p=0.04$), IL-6 ($p=0.03$) and TNF- α ($p=0.008$) were detected in GDM placental explant supernatants. Placental NLRP3 expression was significantly increased in GDM ($p=0.04$). CD14+CD206+ macrophages were significantly elevated in GDM placental tissue ($4.97\% \pm 1.76\%$ vs. $2.23\% \pm 0.99\%$, $p=0.01$) while visceral omentum tissue had significantly lower percentages of CD14+CD86+ M1-like macrophages in GDM ($13.62\% \pm 3.88\%$ vs. $28.79\% \pm 11.4\%$, $p=0.005$).

Conclusion: Mitochondrial dysfunction drives increased circulating mtDNA levels, mitochondrial superoxide production and immune dysregulation in GDM.

98. Understanding the implementation of a befriending service to support the needs of isolated vulnerable adults in the community: A rapid analysis.

Riordan F¹, van de Water T¹, McHugh S¹

¹*University College Cork*

Background

COVID-19 has increased the focus on befriending services to support and connect vulnerable people. Given the dearth of research on these services in Ireland, we aimed to understand the implementation of a local befriending service from multiple perspectives.

Methods

We analysed data on referral source and reason from the client database, and conducted semi-structured interviews and focus groups with service coordinators, volunteers, and health care professionals (HCPs), July-September 2021. Audio recordings were rapidly summarised before synthesising across study objectives.

Findings

Most referrals were from public health nursing (n=66/232, 28%) and community health workers (n=51/232, 22%), main reasons were mental health (n=63/279, 23%), isolation/loneliness (n=60/279, 22%), or mobility/disability (n=55/279, 20%). We conducted interviews with three coordinators, ten HCPs, one volunteer, and conducted two focus groups with volunteers (n=8). Service implementation was strengthened by the continuity provided by a central coordinator, and long-standing trusted relationships with other agencies and health care providers. Ad hoc funding limited its capacity to take on new clients. While a 'concise' referral form and central coordinator facilitated HCPs to refer to the service, they also flagged the importance of greater service visibility and clear definition for new referrers. Volunteers were 'buoyed' by the role, however, newer volunteers highlighted limited peer support due to remote working. Some found it challenging to manage the boundaries of their relationship with clients.

Conclusion

Under key societal challenges such as the global pandemic, it is important to consider what supports and adaptations befriending services require to ensure sustainable delivery.

101. What is the knowledge of Care Staff and the use of hearing aids in Irish Nursing Homes?

Sheehy L¹

¹*University College Cork*

Background:

Residents of nursing homes can be dependent on care staff for the insertion and maintenance of their hearing aids. There is currently no Irish research carried out in this area.

Methods:

This study applied a quantitative study design. A validated paper-based questionnaire was distributed. Participants were recruited from two Irish publicly funded nursing homes. In total, 58 care staff participated in this study. Descriptive statistics were applied. Kruskal Wallis H tests were used to examine if there was a statistically significant difference in questionnaire answers between the three occupations.

Results:

15% of care staff agreed/strongly agreed that they had received training in the use and care of hearing aids. 20% of care staff agreed/strongly agreed that they knew the approximate lifetime of a hearing aid battery. 100% of care staff agreed/strongly agreed they need more information on the different types of hearing aids. 95% agreed/strongly agreed that there is a need for information on hearing aid maintenance, and 88% of care staff agreed/strongly agreed that they need more information on hearing loss among the elderly.

Conclusion:

It is critical for care staff to acquire the essential information, to care for residents with hearing loss. This could improve the quality of care provided to residents and increase the number of individuals who can obtain audiological services. By providing educational opportunities and informational counselling to care staff and increasing their awareness of community resources, it is possible to improve otology care for the residents living in nursing homes.

105. Are Platelet-Rich Plasma Injections Effective in the Management of Lower Limb Tendinopathies? A Systematic Review

Donnelly C¹, Bailey K¹, O'Sullivan D, McVeigh J
¹University College Cork

Introduction

Tendinopathies are difficult to manage due to their complex pathoetiology. Intra-tendinous injection of platelet-rich plasma (PRP) is an increasingly popular intervention which may improve tendon regeneration via growth factor release. As the clinical efficacy of PRP is inconclusive, the aim of this systematic review was to examine the efficacy of PRP injections in addition to exercise-based interventions for lower limb tendinopathies.

Methods

A systematic review of randomized control trials (RCTs) was conducted following the PRISMA guidelines. The protocol was pre-registered with PROSPERO (ID: CRD42021251907). MEDLINE, CINAHL, EMBASE, Cochrane CENTRAL Register of Controlled Trials and Scopus were searched from January 2005 until October 2020. Eligible studies involved participants ≥ 18 years with a diagnosis of a lower limb tendinopathy and directly compared PRP injections in combination with an exercise program versus placebo injections in combination with an exercise program. The primary outcome was the Victorian Institute of Sports Assessment (VISA) at 12-weeks.

Results

Six studies (n=250) were included in the review. PRP preparation and injection protocols were heterogeneous between all studies. The baseline VISA-A/P scores were 45.95 (PRP) and 45.8 (control) with a mean increase after 12 weeks of 14.1 (PRP) and 13.3 (control). The quality of reporting of interventions using the Template for Intervention Description and Replication demonstrated a mean score of 14.3 out of 22 (maximum).

Conclusion

There is currently insufficient evidence to support PRP intervention for lower-limb tendinopathies. Broad heterogeneities in methodologies and inadequate reporting was observed throughout the studies. Future studies should aim to establish an optimal PRP injection protocol before implementing a rigorous RCT study.

107. Antibody profiling to SARS-CoV-2 in healthcare workers following wave 1 of the COVID-19 Pandemic- decline, persistence and neutralisation.

Mac Sharry J¹, Horgan M, Sadlier C, Laphorne S, Crowley B, O'Riordan S, Fanning L

¹Schools of Medicine and Microbiology, University College Cork, Cork, Ireland

Background

The SARS-CoV-2 pandemic has resulted in rapid vaccine design and increased study into the antibody response to both the virus and vaccine targets. We compared the antigen specificity of antibody types in infected health care workers (HCW) over a 6 month period following diagnosed SARS-CoV-2 infection with an aim to determine specificity and persistence of antibody types.

Methods

Using the Genalyte Maverick 13 antigen- IgG and IgM panel to SARS-CoV-2 we analysed serum of 83 HCWs shortly after infection (V1) and 6 months (V2) subsequently to determine the specific antibody profiles. We also compared this assay to rapid point of care (POC) assays detecting anti-viral nucleocapsid and neutralising anti-Spike antibodies.

Results

Antibodies specific to SARS-CoV-2 nucleocapsid declined significantly ($P < 0.001$) after 6 months. However antibodies to SARS-CoV-2 Spike (S1, S1 RBD, S1/S2 and S2) persisted in the majority of volunteers, with no significant decline in the sample set, after 6 months. The Rapid POC tests confirmed these findings with the neutralising anti-Spike POC test giving comparable results to the sensitive lab based assay.

Conclusions

Detection of antigen specific antibody profiles to SARS-CoV-2 demonstrated decline of anti-nucleocapsid antibodies but persistence of anti-spike antibodies up to 6 months following natural infection in the HCW cohort. The utility of a rapid POC neutralising anti-Spike assay could prove a useful tool in detecting the immune status to SARS-CoV-2 but also aid as a pre-screen for identify cohorts requiring a vaccine booster.

111. Experiences of Religiously Observant Muslim Women as Users of Irish Healthcare Services: A Qualitative Study of Barriers, Facilitators and Recommendations for Improvements

Graves I¹, Cronin M¹, Kabir Z¹

¹School of Public Health, University College Cork

Background: The Irish health system is striving to be more inclusive of minority communities, such as the growing Muslim population. This research explores how inclusive the health service is for religiously observant Muslim women service users, identifies barriers and facilitators to their inclusion and presents recommendations for improvements.

Methods: A qualitative study involving one-to-one, semi-structured interviews via MS Teams was employed, with guidance from two Muslim academics. 21 religiously observant Muslim women were recruited with support from two community organisations and via existing contacts. Thematic analysis was completed using NVivo 12 software.

Findings: A large majority of participants reported healthcare practitioners (HCPs) made some efforts to accommodate them and many reported largely positive experiences. However, barriers and negative experiences were also identified including negative discrimination, stereotypes, and a lack of knowledge of Islam among HCPs, along with an absence of resources for religious practice by Muslim women whilst in hospital. Recommendations include having the choice of a female HCP, greater appreciation of modesty/privacy, cultural sensitivity training, as well as practical resources such as disposable hijabs for surgery, and prayer facilities such as disposable prayer mats.

Conclusion: As the Muslim population in Ireland continues to grow rapidly, this unique exploratory, qualitative study presents valuable insights into the inclusion of religiously observant Muslim women health service users. Detailed recommendations are presented on the provision of practical resources and the need for knowledge of Islam among HCPs, demonstrating the value of public and patient involvement (PPI) in developing health services and health policies.

113. Masking our Communication: Effects of Clear and Surgical Face Coverings on Communication

Bridges N¹, O'Hanlon L¹, Kelly H¹

¹Speech and Hearing Sciences, School of Clinical Therapies

Societal wearing of facemasks became commonplace during COVID-19. Verbal communication requires both auditory and visual cues for successful communication exchange. However, the use of facemasks obscures the mouth removing access to essential visual information which can negatively impact communication.

Aims: This study investigated if communication interaction has changed since the introduction of face masks; explored a comparison of clear and surgical face masks in understanding verbal communication, and, the perceived benefits, barriers, and facemask preferences from the perspectives of the general population.

Method: An online survey was completed by 193 participants (aged 18-79). Participants watched four videos of male and female speakers, who wore either a clear or surgical mask, and gave opinions regarding each mask type in relation to their use, preference, and communication.

Potential associations with gender, age, occupation, and experience of mask type were analysed using Chi-square. Participant comments were analysed using Thematic Analysis.

Findings: Most participants (78%) reported a negative change in their communication exchanges since the requirement for wearing face masks was introduced. 64% favoured clear over surgical masks. Participants noted that Comfort (55%), Protection (52%), Availability (51%), Cost (44%) and Fashion (41%) influenced mask choice. Identified themes regarding facemasks included 'Communication benefits and challenges'; 'Attitudes towards mask design', and 'Potential benefits of clear masks'.

Conclusion: Surgical face coverings can negatively affect verbal communication due to the mouth being covered. Clear facemasks have the potential to circumvent this challenge, although participants reported a hesitancy in adopting these facemasks due to an unappealing mask design.

114. Masking our Communication: The Effects of Face Coverings on the Perception of Facial Expressions

Crowley M¹, McCarthy C¹, Kelly H¹

¹Speech and Hearing Sciences, School of Clinical Therapies

Mandatory wearing of facemasks was an unprecedented Public Health restriction during COVID-19. Few studies have explored the impact of face coverings on the interpretation of emotions from facial expressions which can negatively impact communicative exchange.

Aims: This study investigated if face coverings affect the ability to recognise facial expressions/emotions; pertinence of the location of face coverings (upper versus lower face), and, if face coverings are considered to impact communication.

Method: An online survey was completed by 573 participants (aged 18-75+) who matched photographic facial expressions with emotions (happy, sad, anger, surprise, fear, disgust) under three conditions (upper face covered, lower face covered, uncovered). Accuracy of facial expression identification was analysed. One-way ANOVA compared within/between conditions. Potential association with occupation type was analysed using Chi-square. Participants' reflections on experiences of wearing face masks and impacts on communication were examined using a qualitative descriptive approach.

Findings: 'Happy' was the most accurately identified emotion for all conditions with 'fear' and 'disgust' more challenging to recognise, particularly with lower face covering. There was no association with facial expression/emotion identification and gender, age or occupation. Participants (85%) agreed that face coverings negatively impact communication. Three themes were identified - Visual Aspect of Communication; Understanding Verbal Communication and Interpreting Emotional Expressions.

Conclusion: Face coverings negatively affect facial expression/emotion recognition with lower face coverings posing greater challenges than upper. Participants reported misunderstandings and

breakdowns in verbal communication exchanges and highlighted the importance of seeing the full face to more successfully interpret communicative exchanges.

116. The impact of short-term microbiota depletion on hippocampal electrophysiology in mice

Collins M^{1,2}, Darch H^{1,2}, Olavarria-Ramirez L^{1,2,3}, O’Riordan K¹, McCafferty C^{1,2}, Cryan J^{1,2}

¹*APC Microbiome Institute, University College Cork*, ²*Department of Anatomy and Neuroscience, University College Cork*, ³*School of Applied Psychology, University College Cork*

The gut microbiome refers to the wealth of microorganisms that exist in the gastrointestinal tract. These microorganisms and the metabolites they produce influence host behavior as well as neuronal circuits and activity (1,2). While this influence may appear most profound when the microbiome is altered from birth (3), microbiome interventions in adulthood can produce similar effects. This led to our hypothesis that a short-term perturbation of the microbiota in adult mice may be able to produce changes in synaptic plasticity.

We treated 8-week-old male and female C57BL/6 mice with an antibiotic cocktail, or a singular antibiotic in drinking water and compared them to controls. Following this 2-week treatment, hippocampal slices were taken for electrophysiological examination. We examined basal synaptic efficacy, short-term potentiation, and long-term potentiation. These properties appear to be robust to microbiome perturbation at the age examined as no significant effects of antibiotic treatment were found. While other studies have found changes to neuronal signaling with similar interventions, neuronal impacts of microbiome changes may be highly sensitive to treatment regimes, which will need rigorous testing in the future. Going forward we plan to search for a neurodevelopmental window where microbiome perturbation may have a lasting influence on synaptic plasticity.

1. Ray P, Das D, Pandey U, Aich P. <https://doi.org/10.1101/2020.05.07.083659>
2. Darch HT, Collins MK, O’Riordan KJ, Cryan JF. <https://doi.org/10.1111/ejn.15119> 2021.
3. O’Connor R, Moloney GM, Fulling C, J O’Riordan K, Fitzgerald P, Bastiaanssen TFS, Schellekens H, Dinan TG, Cryan JF, <https://doi.org/10.1016/j.bbr.2021.113156>

120. Targeting two CF-causing mutations with a single pegRNA by PRIME editing

C. Doran K¹, Harrison P¹

¹*Dep. of Physiology, UCC*

Cystic Fibrosis (CF) is a recessive genetic disease caused by mutations in the CFTR gene, which reduce the expression and/or function of the CFTR anion channel on the surface of secretory epithelial cells. To date, More than 350 disease causing mutations have been identified, affecting >70,000 people worldwide.

Precision repair of mutations by CRISPR is a very strong candidate for development of treatments for genetic diseases. Typically, CRISPR based methods can correct one mutation at a time which makes it more challenging to develop a genetic treatment for diseases such as CF that are caused

by a range of different mutations. CRISPR PRIME, a recently developed CRISPR based method allows us to correct small clusters of mutations.

In this project we are focusing on two CF-causing, nonsense mutations that are in close proximity, R1158X and R1162X. In addition to targeting multiple mutations, CRISPR PRIME has two main advantages for clinical development over other CRISPR methods. It does not introduce double-stranded breaks in the genome and does not require a donor DNA template. We have designed several prime editing guide RNAs (pegRNAs) to target R1158X and R1162X following the published guidelines. We are in the process of testing these pegRNAs in 2 different Hek293 Flp-In cell lines that have R1158X and R1162X mutations separately. After editing is confirmed, we will test recovery of protein function and evaluate delivery methods suitable for in vivo usage.

122. Rationalising Counterion Selection for Development of Lipophilic Salts to Eliminate Variable Food Effect: Case Study with Venetoclax

Ryan C¹, O'Shea J¹, Griffin B¹

¹SSPC, the SFI Research Centre for Pharmaceuticals, School of Pharmacy, University College Cork

Lipid-based formulations (LBF) can enhance oral bioavailability and negate potential pharmaceutical food effects for some poorly water-soluble oral oncology drugs. However, their usage can be hindered by low dose loading due to poor solubility of the drug in lipid excipients. Previous work has demonstrated that converting poorly soluble drugs to lipophilic salts can significantly increase the solubility of these drugs in lipid excipients allowing a suitable dose loading to be achieved. This study investigated selecting appropriate counterions to form lipophilic salts of the BCS Class IV drug venetoclax. Counterions used included, sodium docusate, sodium n-octadecyl sulfate, sodium lauryl sulfate, sodium dodecyl sulfate, sodium octane sulfonate and triflimide. The formation of these salts was analysed using ¹H & ¹³C NMR, FTIR and DSC. HPLC was used to analyse the purity of the formed salts. The solubility of these salts in lipid excipients was measured. Biorelevant dissolution and digestion studies were also performed. It is anticipated that the present study will allow for an accurate prediction of suitable counterions to be used in the synthesis of lipophilic salts so that they can be formulated as an LBF with an adequate dose loading. It is also anticipated that this study will demonstrate that the LBF approach in combination with lipophilic salts can negate the variable pharmaceutical food effect.

131. The effectiveness of Social Prescribing interventions in the management of long-term conditions in community-based adults: A systematic review and meta-analysis

O'sullivan D¹, Bearne L², Harrington J³, McVeigh J⁴

¹Discipline of Physiotherapy, School of Clinical Therapies, University College Cork, ²Faculty of Health, Social Care and Education Centre for Health and Social Care Research Kingston University St George's London, ³School of Public Health College of Medicine and Health 4th Floor, Western Gateway Building, Western Road, University College Cork Cork,, ⁴Discipline of Physiotherapy School of Clinical Therapies, University College Cork

Aims

To evaluate the effectiveness of social prescribing (SP) interventions in the management of long-term conditions.

Methods

Seven electronic databases were searched until August 2021. Randomized/quasi-randomized controlled trials were included. Studies examining the effectiveness of SP interventions in any long-term condition (LTC), using laypeople link workers. Outcomes of interest were quality of life (QOL), physical activity (PA), psychological well-being. Bias was assessed with the Cochrane Risk of Bias 2 tool. Data was summarized qualitatively using narrative synthesis. 5 studies using HBA1c outcomes in diabetes were included in a meta-analysis. Effect sizes were presented as standardized mean differences with 95 % confidence intervals.

Results

Eleven studies (n=3305 participants) were included: diabetes (n=8), cancer (n=1) and multiple health conditions (n=2). Most participants were urban dwellers and average age was 53 years. SP interventions were heterogeneous and lasted from 4-weeks - 18-months. Most link workers were trained and provided one-to-one contact by telephone, text messages or face-to-face. Thirty-six different outcome measures were used across studies with disease specific measures the most common. There was evidence for improved outcomes with SP interventions, in QOL, psychological well-being and physical activity. For those with diabetes SP interventions had no impact on HBA1c at 6 months (SMD -0.08 [-0.19, 0.03]; P=0.17). There was substantial risk of bias across studies with poor blinding and large dropout rates.

Conclusions

Heterogeneity of interventions and outcome measures coupled with methodological weaknesses makes it difficult to be definitive on the effectiveness of social prescribing interventions in LTCs.

133. The National Perinatal Epidemiology Centre

Mckernan J¹, Greene R¹, Corcoran P¹, Manning E¹, Leitao S¹, Keane J, Campillo I¹, White E¹, Escanuela Sanchez T¹, O'Farrell I¹

¹National Perinatal Epidemiology Centre Department of Obstetrics and Gynaecology UCC

Background

The National Perinatal Epidemiology Centre is based in Cork University Maternity Hospital. The overall objective of the Centre is to collaborate with Irish maternity services to translate clinical audit data and epidemiological evidence into improved maternity care for families in Ireland. "Clinical audit is a clinically-led quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and acting to improve care when standards are not met. The process involves the selection of aspects of the structure, processes and outcomes of care which are then systematically evaluated against explicit criteria." DOHC (2008, p. 152)¹

The specific roles of the NPEC are:

- To collaborate with government agencies to collate outcome data from maternity hospitals in Ireland.

- To evaluate and publish nationally representative perinatal mortality and severe maternal morbidity data on an annual basis.
- To contribute to the development of clinical protocols and guidelines based on analysis of data.
- To act as a resource for the Minister of Health and the Department of Children and Youth Affairs.

The national audits completed by the NPEC are

- Perinatal Mortality National Clinical Audit
- Severe Maternal Morbidity
- Planned Homebirths in Ireland
- Very Low Birth Weight Infants
- Neonatal Therapeutic Hypothermia

The Perinatal Mortality National Clinical Audit was recently endorsed by the Minister for Health following a rigorous process with the National Clinical Effectiveness Committee

1. <https://www.hse.ie/eng/about/who/nqpsd/ncca/nomenclature-a-glossary-of-terms-for-clinical-audit.pdf>

134. Evaluating dementia palliative care services across Ireland and the UK using the RE-AIM framework

Rukundo A, Fox S, Timmons S, O'Connor N, Guerin S, Kernohan G, Drennan J, Brennan A

¹Centre for Gerontology and Rehabilitation, School of medicine,

Background:

Dementia is a life-limiting illness, requiring a palliative care (PC) approach. This study aimed to evaluate five exemplar community-based dementia PC services across Ireland and the UK (as identified by key stakeholders), to inform a service delivery model.

Methods:

Data from semi-structured interviews and focus groups with 29 service providers, and service activity data (n=5), was evaluated using the RE-AIM framework.

Results:

Reach: Caseloads varied significantly (3-154 active cases). Most services accepted self-referrals; all wanted earlier referrals. Factors influencing reach included co-location, dyadic participation, service flexibility, and others' awareness of PC appropriateness and the service's existence.

Effectiveness: All service-users received holistic assessments; person-centred care, advanced care planning, care continuity, improved service access and 'care-for-the-carer'. Some services offered complimentary therapies, 24/7 phone support, and bereavement support; these were perceived to improve quality-of-life, comfort, and independence.

Adoption: Service staff were highly invested. Outside staff were more willing to engage (refer/support) when shared governance, training was provided, familiar with dementia or the tools. Incentive programmes increased adoption rates.

Implementation: All services had ad-hoc evolution, funding by local organisations, a single 'driving force', typically a consultant/nurse, and heavy reliance on volunteers. Perceived "essential" elements

included a dyadic approach, MDT involvement, open communication, forming relationships, reflective practices, dedicated staff, and staff support/training.

Maintenance: All services continued after initial project funding; three increased their activities/reach over time.

Conclusion:

These important features and facilitators of community-based dementia palliative care services are informing a new Dementia Palliative Care model for use in Ireland (<https://pallcare4dementia.com/>).

135. The Unmet Needs of Patients Living With Metastatic Breast Cancer: A Literature Review

Mitchell N¹

¹University College Cork, ²Cork University Hospital

Metastatic Breast Cancer (MBC), also commonly referred to as advanced or stage 4 breast cancer, is a mostly incurable disease of significant prevalence (1). Due to advancements in medical treatments and technology, patients with MBC are living for far longer than was previously possible. 'Living with and beyond cancer' may also be referred to as survivorship, and has been identified as a priority by the National Cancer Strategy (2).

We hypothesise that there are many unmet needs specific to MBC urgently requiring address that this review is intended to explore, as support services for patients with MBC have not progressed as rapidly as this patient subset has grown and therapies have improved. These needs may include long term symptom management, which differs greatly dependant on the sites of metastases, informational needs, as well as needs regarding cognition, finances, relationships, spirituality, psychological and social wellbeing of patients with MBC.

The aims of this review are firstly, to investigate and describe the existing evidence regarding concerns, issues and unmet needs of patients with MBC and secondly to explore existing evidence based programmes and interventions both nationally and internationally dedicated to meeting these needs.

In order to identify these needs, we have conducted a comprehensive electronic search of the existing literature regarding the needs of patients with MBC, and subdivided our findings into the prevalent themes.

The findings of this review hope to inform the future development and implementation of support services for patients with MBC.

140. Hypertensive disorders of pregnancy and long-term risk of maternal stroke – A systematic review and meta-analysis

Brohan M¹, Daly F², Kelly L³, McCarthy F⁴, Kublickiene K⁵, Khashan A¹, Barrett P¹

¹*School of Public Health, University College Cork*, ²*School of Medicine, University College Cork*,

³*Department of General Medicine, Beaumont Hospital*, ⁴*Irish Centre of Maternal & Child Health, University College Cork*, ⁵*Division of Renal Medicine, Department of Clinical Intervention, Science and Technology, Karolinska Institutet*

Hypertensive disorders of pregnancy (HDP) are associated with long term risks of cardiovascular disease in parous women. However, little is known about whether HDP are associated with increased risk of ischaemic stroke (IS) or haemorrhagic stroke (HS) in later life.

This systematic review aims to synthesise the available literature on the association between HDP and long-term risk of maternal stroke.

PubMed, Web of Science and CINAHL were searched from inception to 1st June 2021.

Papers included were case-control or cohort studies, conducted on human participants, available in English, reporting on at least 20 cases, measuring the exposure of a history of HDP and the outcome of maternal IS or HS.

Three reviewers extracted data and appraised study quality following the Meta-analyses of Observational Studies in Epidemiology (MOOSE) guidelines and using the Newcastle-Ottawa scale. The primary outcome was any stroke (AS) and secondary outcomes included IS and HS. The review protocol was registered on PROSPERO (CRD42021254660).

25 studies met the inclusion criteria. HDP were significantly associated with AS, aRR 1.76 (95% CI, 1.41-2.20). Preeclampsia (PE) was significantly associated with AS, aRR 1.71 (95% CI, 1.50-1.96), IS, aRR 1.68 (95% CI, 1.17-2.43), and HS, aRR 2.45 (95% CI, 1.36-4.41). Gestational hypertension was only significantly associated with AS, aRR 1.23 (95% CI, 1.20-1.26), and IS, aRR 1.38 (95% CI, 1.14-1.67).

In this meta-analysis, exposure to HDP, including PE and gestational hypertension, appears to be associated with an increased risk of AS and IS, in parous women in later life.

141. Evaluating the Self-harm Assessment and Management for General Hospitals (SAMAGH) Training Programme: Findings from a Focus Group Study

Sadath A¹, Troya I², Khan A³, Cully G⁴, Nicholson S⁵, Cassidy E⁶, Jeffers A⁷, O'Mahony J⁸, Kelleher E⁹, Kinahan J¹⁰, Griffin E¹¹, Ruane-McAteer E¹², Arensman E¹³

¹*School of Public Health and National Suicide Research Foundation*, ²*School of Public Health and National Suicide Research Foundation*, ³*School of Public Health and National Suicide Research Foundation*, ⁴*School of Public Health and National Suicide Research Foundation*, ⁵*School of Public Health and National Suicide Research Foundation*, ⁶*Liaison Psychiatry Service, Cork University Hospital Group*, ⁷*National Clinical Programme for the Assessment and Management of Patients presenting to the Emergency Department following Self-Harm, Office of the National Clinical Advisor and Group Lead, Dr. Steeven's Hospital*, ⁸*College of Medicine and Health, University College Cork*, ⁹*Mercy Hospital, Cork*, ¹⁰*Mercy Hospital*, ¹¹*School of Public Health and National Suicide Research Foundation*, ¹²*School of Public Health and National Suicide Research Foundation*, ¹³*School of Public Health and National Suicide Research Foundation*

Background

Healthcare professionals report limited training on self-harm assessment and management

Objective

To evaluate the Self-Harm Assessment and Management for General Hospitals (SAMAGH) training by examining the experience, attitudes, and knowledge of healthcare professionals involved in the training.

Method

Between November 2019–November 2020, 35 healthcare professionals participated in the SAMAGH training and a subgroup was invited to partake in an online focus group to discuss their experiences and implementation with the SAMAGH training. A topic guide was used to facilitate the focus group discussion to ask about healthcare professionals' experiences and existing challenges when offering support to self-harm patients. Thematic analysis was used to analyse the data, with two independent researchers coding and identifying relevant themes.

Results

A total of six participants, including five clinical nurse specialists and one consultant psychiatrist, participated in the focus group which lasted 90 minutes. Three main themes were identified: 1) Lack of available training in self-harm assessment and management, 2) Experience of the SAMAGH training, including suitability of the training for healthcare professionals, and barriers and facilitators to attend the training, 3) Impact of the SAMAGH training on healthcare professionals and specific patient sub-groups.

Conclusion

Participants identified the SAMAGH training as relevant, unique, and an opportunity to learn from colleagues. Participants reported lack of self-harm training available to healthcare professionals, and supported that similar trainings should be delivered nationwide to all healthcare staff supporting self-harm patients, including colleagues in primary care.

142. Secondary bile acids suppressed colonic secretion of the pro-inflammatory cytokine, interleukin-6 in Sprague Dawley rats

Xiao Q^{1,2}, O' Malley D^{1,2}

¹*Department of Physiology, College of Medicine and Health, University College Cork*, ²*APC Microbiome Ireland, University College Cork*

Background: Cross-barrier signaling from molecules in the intestinal lumen can impact on intestinal secreto-motor activity and gut-to-brain signaling. In addition to facilitating lipid digestion and absorption, hepatic bile acids (BAs) also act as signaling molecules, where their bioactivity is determined by their conjugation status and whether or not they have been microbially modified.

The aim of this study was to explore the physiological effects of primary and secondary BAs on colonic function with a focus on the pro-inflammatory cytokine, interleukin-6 (IL-6).

Methods: Fluorescent immunolabeling was used to investigate expression of G protein-coupled bile acid receptor 1 (GPBAR1, also called TGR5) and IL-6 receptors in colonic tissue from healthy Sprague Dawley rats. The pro-secretory effects of primary and secondary BAs were assessed by measuring basolateral secretion of IL-6 using an enzyme-linked immunosorbent assay (ELISA).

Calcium imaging was used to assess the neurostimulatory effects of primary and secondary BAs on submucosal neurons.

Results: TGR5 and IL-6 receptors are both expressed on colonic submucosal neurons, however, exposure of submucosal neurons to both primary and secondary bile acids had no direct stimulatory actions. Interestingly, secondary (CDCA, LCA, and TLCA) but not primary BAs (CA and DCA) inhibited colonic basolateral secretion of IL-6, which has neurostimulatory actions on submucosal neurons.

Conclusions: Consistent with previously reported inhibitory actions of BAs in the gut, unconjugated and conjugated secondary BAs inhibited basal colonic secretion of IL-6 when applied to the mucosal side. As IL-6 has neurostimulatory actions on submucosal neurons, this could indirectly modify colonic absorpto-secretory function.

143. Sex-Dependent Effects of Early-Life Microbiota Depletion on Behaviour, Neuroimmune Function and Neuronal Development

Lynch C^{1,2}, Cowan C¹, Bastiaanssen T¹, Moloney G², Theune N¹, Van de Wouw M¹, Florensa Zanuy E¹, Ventura-Silva A¹, Dinan T^{1,3}, Clarke G^{1,3}, Cryan J^{1,2}

¹*APC Microbiome Ireland, University College Cork*, ²*Department of Anatomy & Neuroscience, University College Cork*, ³*Department of Psychiatry & Neurobehavioural Sciences, University College Cork*

While epidemiological studies have shown that early-life antibiotic-induced microbial disruption can increase an individual's risk of developing immune and metabolic diseases, preclinical studies have shown that long-term antibiotic-induced microbial disruption in early life can have enduring effects on brain physiology and behaviour. However, these studies have not investigated the impact of targeted antibiotic-induced microbiota depletion during critical developmental windows and how this may be related to neurodevelopmental outcomes. Here, we addressed this gap by administering an oral antibiotic cocktail to mice in one of three putative critical windows: the postnatal (P2-9), pre-weaning (P12-18), or post-weaning (P21-27) developmental periods. Our results demonstrate that early life microbiota depletion has enduring effects into adolescence on the developing caecal microbiome, circulating immune cells, and neurophysiology (including altered myelin-related gene expression in the prefrontal cortex and malformed microglia in the basolateral amygdala). We also observed an effect of sex and timing of treatment on behavioural outcomes in adolescence and adulthood, whereby microbial disruption in the PreWean timepoint was associated with increased anxiety-like behaviour. No significant effects of microbial disruption were observed in depressive-like or memory related-behaviours. Overall, this study highlights the vulnerability of the gut microbiota during critical windows of development and the subtle effects that microbiota-targeted perturbations can have on brain physiology and behaviour.

145. Development of a Bioassay to Detect Inhibition of Intervention in Bacterial Microcompartment Shell Protein Crosslinking

Wang Z^{1,2,3}, Kampik C^{1,2,3}, Shoemark D⁴, Tangney M^{1,2}, Warren M⁵, Prentice M^{2,3,6}

¹*Cancer Research UCC*, ²*APC Microbiome UCC*, ³*School of Microbiology UCC*, ⁴*School of Biochemistry*, ⁵*Quadram Institute*, ⁶*Cork University Hospital*

Bacterial microcompartments (BMCs) are large, protein-based organelles, which consist of selectively permeable protein shells and encapsulated enzymes. BMCs are typically 100-200nm in diameter, and can be classified into metabolosomes and carboxysomes according to their functions. According to BMC protein structure, there are three classes of building block proteins which self-assemble to form the shell: BMC-H, BMC-T, and BMC-P. The BMC-H and BMC-T form hexamers or pseudohexamers, while BMC-P forms pentamers. Hydrogen bonds between lysine residues on the edges of the hexamers or pseudohexamers are key factors linking hexamers together to make protein sheets. A well-studied type of BMC is the 1,2-propanediol utilization bacterial microcompartment (Pdu). Recent research revealed that the overexpression of some BMC-H

components of Pdu BMC shell proteins produces intracellular protein tubes (requiring hexamer crosslinking), which prevent cells from dividing and cause the formation of elongated cells. Our collaborator Dr. Deborah Shoemark from the University of Bristol has generated a list of small molecules with high ligand efficiency scores (predicted binding energy (kJ/mol)/number of heavy atoms) to bind the key residues required for cross linking of the Pdu hexamer proteins. We therefore hypothesize that these small molecules will prevent the formation of nanotubes, and that we can detect this effect by light microscopy of *E. coli* over-expressing a BMC-H protein.

146. Microbial-Derived Metabolites Induce Actin Cytoskeletal Rearrangement and Protect Blood-Brain Barrier Function

Knox E^{1,2}, Aburto M^{2,3}, Clarke G^{2,4}, O'Driscoll C¹, Cryan J^{2,4}

¹Pharmacodelivery Group, School of Pharmacy, University College Cork, ²APC Microbiome Ireland, University College Cork, ³Department of Anatomy and Neuroscience, University College Cork, ⁴Department of Psychiatry and Neurobehavioural Science, University College Cork

The gut-brain axis allows the microbes that reside in the gut to influence host brain, behavior, and molecular processes. One of the pathways along this bidirectional communication system is humoral signaling which involves microbial-derived metabolites including short chain fatty acids (SCFAs). SCFAs such as butyrate and propionate can enter circulation and interact with the blood-brain barrier (BBB). Endothelial cell structure is vital to maintaining BBB integrity and function. However, it remains underexplored whether it is affected by increasing concentrations of SCFAs. Here, we use a well-established in vitro BBB model treated with physiologically relevant concentrations of butyrate and propionate with and without lipopolysaccharide (LPS) to examine the effects of SCFAs on actin cytoskeleton arrangement and tight junction protein localization. Both metabolites induced distinct alterations to filamentous actin directionality. The metabolites also increased tight junction protein spikes and protected localized cell-cell tight junction protein expression, mitochondrial networks, and BBB integrity. Taken together, these results suggest that butyrate and propionate alter actin cytoskeletal arrangement in brain endothelial cells and further emphasizes the importance of microbial metabolites on BBB physiology.

147. Identifying the challenges for deaf patients during medical imaging

McEntee M¹, O Riordan J¹, Young R¹, England A¹

¹UCC

Background

Deaf people continue to face barriers every day within all aspects of the health system and the Radiology Department is no exception. A study by Davies & Channon (2004) highlighted some of the problems that deaf people faced in the Radiology Department particularly around giving 'informed consent' and during 'examinations that required patients to follow verbal instructions.' The aim of this study is to investigate the satisfaction of deaf people in relation to their experience in the Radiology Department and to establish successful communication strategies that fit within the radiography framework.

Method

A sign-language facilitated solution-focused workshop was conducted with eight members of the deaf community over a two-hour period at University College Cork. The six core questions posed helped to identify key challenges and uncover possible solutions.

The workshop was video-recorded using Microsoft Teams and was then manually transcribed by the primary researcher. The data collected from the workshop were analysed for thematic content using NVivo computer software.

Results

The four main themes that were identified included Sars-Cov-19, attitude, communication and awareness. The main themes and subthemes will be displayed in the thematic mind map in

Conclusion

Patients believe that healthcare professionals are not aware of the extent of the needs and characteristics of deaf patients and there are limited resources to support communication between these groups. Our qualitative study to evaluate deaf people's experiences in Irish radiography departments has highlighted the urgent need for deaf-patient-led solutions.

4. Peripheral administration of the Class-IIa HDAC inhibitor MC1568 partially protects against nigrostriatal degeneration in the striatal 6-OHDA rat model of Parkinson's disease.

Mazzocchi M¹, Goulding S¹, Morales-Prieto N¹, Foley T¹, Collins L^{1,2}, Sullivan A^{1,3}, O'Keeffe G^{1,3}

¹Department of Anatomy and Neuroscience, ²Department of Physiology, ³APC Microbiome Ireland

Parkinson's disease (PD) is a neurodegenerative disorder characterized by nigrostriatal dopaminergic (DA) degeneration. There is a critical need for neuroprotective therapies, particularly those that do not require direct intracranial administration. Small molecule inhibitors of histone deacetylases (HDAC) (HDIs) are neuroprotective in in vitro and in vivo models of PD. We show that 6-hydroxydopamine (6-OHDA) treatment induces protein kinase C (PKC)-dependent nuclear accumulation of Class IIa HDAC5 in SH-SY5Y cells and cultured DA neurons. Treatment of these cultures with the Class-IIa specific HDI, MC1568, partially protected against 6-OHDA-induced cell death. In the intrastriatal 6-OHDA lesion in vivo rat model of PD, MC1568 treatment (0.5 mg/kg i.p.) for 7 days reduced forelimb akinesia and partially protected nigral DA neurons and their striatal terminals. MC1568 prevented 6-OHDA-induced increases in microglia in the striatum and nigra, and in nuclear HDAC5 levels in nigral DA neurons. These data rationalize the study of peripheral administration of Class-IIa specific HDIs as a potential neuroprotective therapy for PD.

17. Severe maternal morbidity and critical care requirements in pregnancy in Ireland

Kaskun O¹, Leitao S², Greene R²

¹University College Cork, ²NPEC-Cork University Maternity Hospital

Introduction:

Maternal health is a measure of socioeconomic progress. Assessing severe maternal morbidity (SMM) is an important quality indicator. The National Perinatal Epidemiology Centre (NPEC) conducts yearly audits in Ireland to track SMM.

Aim:

Study characteristics of women who experienced SMM in Ireland between 2011-19. Analyse the prevalence of 16 specific SMMs and potential associated factors.

Methods:

A secondary analysis of audit data collected by NPEC from 19 Irish Maternity Units between 2011 and 2019 was performed. The units provided anonymised standardised demographic and clinical data from eligible women (recently pregnant women up to 42 days following pregnancy end). Descriptive analysis and correlation testing was performed.

Results:

3093 SMM cases were identified. SMM rate increased by 68% between 2011-19 from 3.85 to 6.47 per 1,000 maternities. Major obstetric haemorrhage (MOH) accounted for half of SMM cases

(50.2%) and intensive or coronary care unit admission was reported for two in five SMM cases (43.4%). Similar proportion of cases were in women aged 35 or older (42.0%) and nulliparous (41.9%). Almost a quarter of cases (24.3%) occurred in women with obesity. Higher level of critical care was associated with women aged 30 or older ($p=0.021$).

Conclusion:

SMM affects many women and its incidence increased in the nine years of the audit. Further study is required to reduce the high occurrence of MOH. Increased BMI and age are risk factors for SMM, recommending closer monitoring. Improved data collection is needed to establish the influence of smoking and alcohol consumption on SMM incidence.

22. A review of central nervous system lymphomas (CNSL) diagnosed at a single tertiary referral neuroscience centre.

Gupta E¹, Bermingham N²

¹*School of Medicine, University College Cork*, ²*Department of Neuropathology, Cork University Hospital*

Primary central nervous system lymphoma (PCNSL) is a rare, aggressive form of non-Hodgkin lymphoma that develops within the brain and spinal cord. This study aims to identify the incidence, demographics and presentation of those diagnosed with PCNSL in Cork University Hospital (CUH) over a 10 year period, and examine the pathology and outcomes of patients.

This retrospective chart review used the neuropathology database in CUH to identify 74 patients with a diagnosis of PCNSL from January 2011 to December 2020. Demographical, clinical and pathological information was recorded, along with outcomes. Descriptive and Kaplan-Meier survival analysis was conducted.

There were 50 patients with PCNSL identified from 2011 to 2020, which equated to an incidence rate of 0.417 per 100,000. The other 24 patients had systemic lymphoma that metastasised to the brain. Mean age at diagnosis was 63.9 years and 52% were male. Confusion, ataxia and headache were the commonest presenting symptoms. 98% were classified as diffuse large B-cell lymphoma ($n=49$), and one patient had immunodeficiency-associated lymphoma. The most common radiological sites of lesion was supratentorial ($n=36$). All patients tested positive for CD20. At present, 17 patients are alive, 25 are dead from PCNSL, 7 are dead from other causes, while 1 patient's outcome is unknown. Mean survival time was 41.7 months overall.

This is the second study to examine PCNSL in Ireland, and the first to report referrals to this tertiary neuroscience centre. The data suggests the incidence of PCNSL may be increasing, and survival of patients has improved.

23. The Prevalence of Dental Caries in adults with Cystic Fibrosis.

O'Leary F¹, Coffey N, Hayes M, Burke F

¹*Clinical Fellow in Restorative Dentistry, Cork University Dental School & Hospital*

Objectives:

A study was conducted to assess the prevalence of dental caries in an adult population with Cystic Fibrosis (CF), the most common autosomal recessive condition in Caucasians.

Methods:

A total of 100 participants recruited from the adult CF unit in CUH underwent a dental examination carried out by two calibrated (ICC=.94) dentists. Dental caries was measured using the WHO recommended Decayed, Missing, Filled teeth (DMFT) Index.

Results

Of the 100 participants in the study, 60 were male and 40 were female. The age ranged from 18-69 years.

The mean (SD) values of Decayed teeth (DT), Missing teeth (MT), and Filled teeth (FT) of the participants were $.61 \pm 1.42$, $.93 \pm 1.27$, 2.11 ± 2.00 respectively. The mean (SD) value of the total DMFT index was 1.22 ± 1.05 in all participants.

Conclusion

Caries prevalence among adults with CF is generally low. This may be attributed to a greater awareness of their health. It may also be attributed to chronic medication use or microbiomes specific to this population. This differs from other studies who reported "caries experience in patients with CF was higher."

One third of adults with CF have low bone mass density and develop CF related osteoporosis. They are routinely placed on bisphosphonate therapy to manage this at a relatively young age. Given the associated oral risks of bisphosphonate therapy, people with CF should have no or very low levels of dental disease. Therefore this group would benefit from targeted oral health prevention strategies to maintain optimal oral health.

25. General practitioners' perceptions of pharmacists working in general practice: a qualitative interview study.

Hurley E^{1,2}, Walsh E², Foley T², Heinrich C¹, Byrne S¹, Dalton K¹

¹School of Pharmacy, University College Cork, ²Department of General Practice, University College Cork

Introduction: Pharmacists in general practice have been shown to enhance patient care and are becoming increasingly prevalent worldwide. Yet, little is known about general practitioners' (GPs') perceptions of pharmacists working alongside them in this setting. Therefore, this study aimed to investigate GPs' perceptions to inform future efforts to integrate pharmacists into general practice.

Methods: Semi-structured interviews were conducted with GPs practising in the Republic of Ireland between October 2021 and February 2022. Content analysis was used to identify the most relevant domains from the Theoretical Domains Framework (TDF) that affected the theoretical integration of pharmacists into general practice.

Results: Seventeen GPs were interviewed. Five TDF domains were found to be most relevant in affecting pharmacist integration: 1) 'environmental context and resources' (space, government funding, information technology, current workplace pressures, increasing patient complexity, indemnity, moves towards group practices); 2) 'social professional role and identity' (role definition, clinical governance, pharmacist prescribing, medication review and monitoring); 3) 'social

influences' (teamwork, comparisons with nurses, supporting GPs); 4) 'beliefs about consequences' (patient safety, cost savings, workload); and 5) 'beliefs about capabilities' (beliefs about GPs' capabilities, beliefs about pharmacists' capabilities).

Discussion: This is the first qualitative interview study to focus on exploring GPs' perceptions of pharmacists working in general practice outside of private practice settings. It has provided a deeper understanding of GPs' considerations regarding the integration of pharmacists into general practice. In addition to informing future research, these findings should help optimise future service design and aid pharmacist integration into general practice.

31. Beliefs and awareness of common cancer risk factors among Irish males

Scannell C¹, Stella Sullivan E¹, Dolan O², Power D³, Ryan A¹

¹*School of Food and Nutritional Sciences, University College Cork*, ²*Breakthrough Cancer Research*,

³*Dept. of Medical Oncology, Mercy University Hospital and Cork University Hospital*

Background: Poor knowledge of cancer risk factors among Irish females has previously been reported. Primary prevention remains the key recommendation to tackle the rising rates of cancer globally. Successful prevention involves identifying the public's perception and dispelling any cancer-related myths. Little is known about the male perception of cancer risk factors in Ireland.

Methods: A 43-question online survey was constructed.

Results: There were 995 male respondents, 9% were healthcare professionals (HCPs). Mean (SD) age was 37 (11) years. Worrying about developing cancer was reported by 74%. When asked the open-ended question "in your opinion what are the top 5 risk factors for cancer?", the top responses were smoking (80%), poor diet (71%) and consuming alcohol (48%). It was identified by 95% that diet plays a significant role in cancer risk, but when asked about individual dietary factors, knowledge gaps appeared. Only 63% were aware that red meat is a risk factor for cancer. It was thought that organic food (58%) and detox diets (23%) would reduce cancer risk. Supplements were deemed necessary for cancer prevention by 25% of HCPs and 38% non-HCPs ($p=0.018$). 47% of HCPs and 52% of non-HCPs disagreed that 'Complete avoidance of alcohol is the best way to prevent cancer' ($p=0.004$). The location of fat in the body was not seen as important by 16% of HCPs and 30% of non-HCPs (apple vs. pear-shaped) ($p=0.004$).

Conclusion: A considerable proportion of Irish males are misinformed. Efforts are needed to improve public health messages relating to cancer risk.

35. Rituximab – Patient Management and Outcomes in the Covid-19 era

Stoneman S¹, Crowley S², Alfaraj F², Murphy G², Clarkson M¹

¹*Department of Renal Hospital, Cork University Hospital*, ²*Department of Rheumatology, Cork University Hospital*

Background: Rituximab (RTX) is a chimeric anti-CD20 antibody that results in B cell depletion. Vaccination of the the vulnerable immunosuppressed population is an essential component of the

public health response. Evidence suggests that B cell-depleting therapy with RTX blunts humoral immune responses after vaccination. There are also concerns that delaying rituximab to facilitate vaccination may lead to flares of the underlying disease.

Methods: This is a retrospective observational cohort study of patients treated with RTX at a tertiary referral centre.

Results: A total of 210 immunocompromised patients were included in the study. 94 patients had their treatment with rituximab delayed, primarily to facilitate augmented vaccination responses. Of these, 48 patients experienced a disease flare (51%). In contrast only 23 of 116 patients who continued RTX experienced a disease flare (19%). 42 patients in the study had their immunosuppression treatment changed for various reasons, predominantly to re-establish disease control following flare. 184 (87%) of patients were vaccinated against CoVid-19. 13 were not vaccinated, of which 7 chose not to be vaccinated, 2 tested positive for CoVid-19 before the roll out of the vaccine programme and 4 died before the vaccine roll out. 16 patients (7.6%) contracted CoVid-19. Of these, 6 were not vaccinated. 37.5% of infected patients required hospitalisation.

Conclusions: Withholding therapy associated with an enhanced risk of disease flare. The majority of our patients chose to be vaccinated. Those who contracted CoVid-19 despite vaccination had worse hospitalisation rates compared to the general population.

37. Medication Challenges in the Post-Stroke Patient: A Qualitative Study

Bell S¹, Kelly H¹, O'Flynn J², Bermingham M¹, Negrao L³, Riemenschneider H⁴, Lyons I¹, **Sahm L¹**
¹University College Cork, ²Cork University Hospital, ³Portuguese Heart Foundation, ⁴Technische Universität Dresden

Background:

Secondary prevention medications are essential in the management of patients who have experienced a stroke to prevent recurrent cerebrovascular events. However, in the post-stroke period, patients face many medication-related challenges. These challenges are poorly described in the literature, particularly at the transition of care between hospital and home.

Healthcare Professionals (HCPs) in primary care e.g. community pharmacists and speech and language therapists are crucial points of contact for stroke patients' post-discharge. Poor communication between the acute and primary care settings can impede the ability of HCPs to adequately support patients during this period.

The objective of this study is to elicit knowledge, attitudes, and beliefs of patients or carers and HCPs in relation to medication challenges in the patient after discharge from the stroke unit.

Methods:

This qualitative study will examine the lived experience of patients, carers, and HCPs in relation to the continuity of care post-discharge from stroke unit. Participant groups are comprised of patient/carer dyads and HCPs. Data will be collected via a series of semi-structured interviews and analysed using thematic analysis.

Findings:

This project is a work in progress and does not yet have results.

Discussion:

Knowledge of medication-related challenges will better inform stroke discharge planning, with the aim to improve medication compliance in the post-stroke patient thereby reducing risk of recurrent stroke and contributing to better patient outcomes through enhancing seamless care. As this project is part of a wider European collaboration, results will contribute to improved continuity of care in an international context.

40. The Effects of Perturbation-Based Training on Falls and Kinematic Data in an Older Adult Population: A Systematic Review.

Quilter C¹, Heffernan P¹, McCullagh R¹
¹Discipline Of Physiotherapy, Clinical Therapies, University College Cork

Background: Conventional falls exercise interventions are not task-specific. Treadmill perturbation-based training has been established as a method to train the postural control mechanisms involved in balance recovery from a trip or a slip. The aim of this review is to examine the effects of perturbation-based training on laboratory and community-based falls, and in kinematic variables that predict falls.

Methods: Seven electronic databases were searched from inception to 2020. Randomised and quasi-experimental trials were included. Title, abstract and full-text screening was conducted by two independent reviewers. The Cochrane Risk of Bias Tool and Robins-I were used to assess the Risk of Bias. Data was extracted by two independent reviewers. Laboratory and community-based falls rates and kinematics that predict fallers were the outcomes of interest. A narrative synthesis was completed.

Results: Eight studies (n=1022) were analysed. Three of the eight studies were randomised control trials, whilst the other five were non-randomised. All eight studies conducted perturbation-based training on a treadmill. Six studies reported a decrease in falls post-perturbation-based training. Improvements in kinematic variables was observed in all five studies. Both high and low-dose prescription of perturbations reduce falls and improve kinematic markers that determine 'fallers' from 'non-fallers'.

Conclusion: Perturbation-based training appears to reduce falls in healthy older adults. Further study is needed to draw conclusions on exact frequency, intensity, time and number of perturbations needed.

41. Can behavioural change interventions improve self-efficacy and exercise adherence among people with Parkinson's? A systematic review.

Ahern L¹, Timmons S¹, Lamb S², McCullagh R¹

¹University College Cork, ²University of Exeter

Background: People with Parkinson's (PwP) lead sedentary lifestyles compared to healthy peers. Personal influences including low self-efficacy and poor outcome expectation appear to predict exercise adherence more accurately than disease severity. This review aims to identify successful behavioural-change interventions that promote self-efficacy and exercise adherence among PwP.

Methods: Databases including EBSCO, Medline, CINAHL, Web of Science, PubMed, Embase, Scopus, Google Scholar and Cochrane Library were searched from inception to 2020. Interventional studies including behavioural-change interventions were included. Title, abstract and full-text screening was conducted by two independent reviewers. The Cochrane Risk of Bias Tool and Robins-I were used to assess the Risk of Bias. Data was extracted by two independent reviewers. The outcomes of interest were self-efficacy, quality of life, physical function, and exercise adherence. A narrative synthesis was completed and mapped to the Theoretical Domains Framework, to produce practice-orientated outcomes.

Results: Seventeen studies (n=1319) were included. Risk of bias was generally moderate. A multicomponent behavioural-change intervention encompassing education, behavioural strategies and support groups appeared to improve quality of life, physical function, and exercise adherence in PwP. No intervention improved self-efficacy. Self-monitoring, goal-setting, social supports, feedback, self-managements skills and action planning improved long-term adherence.

Conclusion: No intervention changed self-efficacy. However, it appears that a multicomponent intervention is essential to improve exercise adherence. Trials directly comparing different

intervention types and adequate follow-up periods are limited, preventing a conclusive finding of the most effective behavioural-change intervention to promote exercise adherence among PwP. Keywords: Parkinson's, self-efficacy, behavioural-change interventions, quality of life, exercise adherence.

43. Regulated Intramembrane Proteolysis of ACE2: A Proposed Role of Host Factor Cleavage in SARS-CoV-2 Syncytiation.

Harte J¹, Wakerlin S¹, Hayes R², Lindsay A³, McCarthy J¹, Coleman-Vaughan C⁴

¹*Signal Transduction Laboratory, School of Biochemistry and Cell Biology, University College Cork,*

²*Cancer Research at UCC, Western Gateway Building, University College Cork,* ³*Membrane Trafficking & Disease Laboratory, School of Biochemistry and Cell Biology, University College Cork,* ⁴*Department of Biological Sciences, Munster Technological University*

SARS-CoV-2 remains a considerable threat to global health due to the emergence of variants of concern. SARS-CoV-2 infection is dependent on the binding of viral spike proteins to host receptors, and on the priming of such proteins by host proteinases. Although binding of the viral spike protein to ACE2 has been well-documented, the functional consequences of ACE2 proteolysis are ill-defined.

Herein, we demonstrate that ectodomain shedding of ACE2 produces a membrane-bound C-terminal fragment (CTF), which is subsequently cleaved by gamma-secretase (Harte et al., 2022 [preprint]). Pharmacological inhibition of gamma-secretase prevents cleavage of the ACE2 CTF. Pharmacological inhibition of proteasomal degradation revealed an ACE2 intracellular domain of hitherto unknown biological activity. Moreover, we show that internalisation of the ACE2 CTF is a pre-requisite for cleavage, and that cleavage occurs within acidified intracellular vesicles of the endolysosomal system.

Our results suggest a spatial proximity between the regulated proteolysis of ACE2 and SARS-CoV-2 fusion from-within.

Therefore, we hypothesised that the proteolysis of ACE2 may identify a host-dependent mechanism contributing to the pathogenesis of SARS-CoV-2. In cell-cell fusion assays, metalloproteinase inhibition reduced spike protein-dependent syncytiation; however, inhibition of gamma-secretase did not. The reduced syncytiation observed with metalloproteinase inhibition is putatively linked to ACE2 ectodomain shedding.

Our results indicate that regulated proteolysis of ACE2 is a contributing factor to SARS-CoV-2 syncytiation and advocate the rationale of repurposing drugs that target metalloproteinases for the treatment of COVID-19. The fate of the ACE2 intracellular domain however, and its role in SARS-CoV-2 infection, remains to be elucidated.

46. Understanding implementation of self-management support in cancer services: a multiple case study of the factors influencing implementation

Pallin N¹, McHugh S¹, Hegarty J, Connolly R¹, Browne J¹

¹*University College Cork*

Background: Self-management support (SMS) programmes for cancer are an evidence-based practice that are not consistently implemented internationally. To bridge the gap between evidence and implementation into practice, understanding existing models of care and barriers and facilitators is required to guide implementation strategy selection and design. This research is undertaking a needs assessment to evaluate current delivery of SMS in cancer centres in Ireland. As well as the factors that influence implementation (drivers for change, contextual factors, type of programme, implementation approaches) and the relationship between these and implementation outcomes (adoption, penetration and sustainability).

Methods: A mixed method multiple case study with cancer centres in eight hospitals in Ireland is ongoing. Multiple methods are being used: a review of documents, a survey to describe the types of SMS programmes, and interviews with oncology health professionals to explore factors influencing implementation. Survey data is being analysed using directed content analysis. Within each case, data from documents and interviews will be analysed using a framework approach. Cross-case analysis will then examine factors associated with implementation. The Consolidated Framework for Implementation Research and Proctor's implementation outcomes framework informed the interview topic guide and is guiding the analysis.

Results: Implementation differs across cancer centres, including type of programme and implementation outcomes. One programme, planned for implementation in the eight centres, has been implemented with varying levels of adoption, reach/penetration and sustainment. Results will highlight what factors influence these variations.

Conclusion: This study will provide a greater understanding the factors necessary for implementing SMS.

52. The Contribution of Audio-Visual Integration to the Recall of Medical Instructions.

Moloney A¹, Shannon C¹, Bessell N¹, Lee A¹

¹University College Cork

Purpose: This study aims to investigate the effect of audio-visual integration on recall of medical instructions across different listening conditions using multi-speaker babble noise at varying Signal to Noise Ratios, and the effect of drug nomenclature on recall of medical instructions.

Method: Forty participants aged between 18-30 years were assigned to a listening condition: No Noise (n=10), +2 SNR (n=10), 0 SNR (n=10), or -3 SNR (n=10). Each participant listened to 10 audio-only and watched 10 audio-visual stimuli of medical instructions, which included 10 brand and 10 generic names. Participants were asked to recall the medical instruction by writing down the 'dose', 'medication name' and 'frequency' with percent correct scores calculated for each. A mixed between-within ANOVA was used to analyse the effect of input, listening condition and drug nomenclature.

Results: The results showed that background multi-speaker babble noise lowers participant recall of medical instructions. Audio-visual integration improves the accuracy of recall of medication names but is of mixed significance for 'dose' and 'frequency'. This study found that brand medication names were more accurately recalled than generic medication names.

Conclusion: This study supports the idea that medical instructions should be delivered to patients where the speaker's face can be seen in an environment with minimal background noise. The use of brand medication names was found to improve recall of medication names in comparison to generic medication names.

58. Gastrointestinal Motility in the Very Preterm Infant and its Implications for Clinical Care

Colussi-pelaez M¹

¹Professor Eugene Dempsey, ²Dr. David Healy

Background: Complete absorptive and electrical function of the gastrointestinal system develops late in gestation and consequently premature infants lack intestinal maturity. Several factors including gestational age, feeding practices and microbiota composition may influence gastric emptying in the preterm infant.

Objectives: This study aims to identify the prenatal, perinatal, and postnatal factors that influence gastrointestinal motility in the preterm infant. The primary objective is to establish the relationship between feeding and stooling behaviour in preterm infants <32 weeks gestation, in addition to exploring factors that influence this relationship.

Methods: This retrospective cohort study looked at a group of n=129 preterm infants <32 weeks gestation born at the Cork University Maternity Hospital (CUMH) between 2017 and 2021. Data was collected from the CUMH electronic record system and subsequently analysed using SPSS.

Results: Preterm infants with lower gestational ages stool less frequently in the first week of life compared to the second week (p=0.013). However, a univariate ANOVA, found that the primary feed type of maternal breast milk had the strongest influence over increased stooling frequency in the second week of life (p=0.009). There was also a positive correlation between preterm infants reaching full enteral feeds earlier and transitioning from meconium to normal stool earlier (p<0.001).

Conclusion & Future Work: Our results suggest that feed advancement can influence earlier transition to normal stool. Future work could look at how early stooling behaviour in the first two weeks of life affects

62. Does Lyso-Gb3 play a causal role in gastrointestinal symptomology in Fabry disease?

Uhlig F¹, Delprete C², Caprini M², Hyland N¹

¹Department of Physiology & APC Microbiome Ireland, University College Cork, ²Department of Pharmacy and Biotechnology, Laboratory of Cellular Physiology, University of Bologna

Gastrointestinal symptoms are among the earliest and most difficult to interpret symptoms reported by Fabry disease (FD) patients. Frequent episodes of diarrhoea severely impact patients' quality of life. Lyso-Gb3 is a clinical marker of FD and modulates activity of dorsal root ganglia

neurons. However, the direct effects of Lyso-Gb3 on gastrointestinal physiology have not been examined. Therefore, we investigated whether Lyso-Gb3 affects the intestinal epithelium and the enteric nervous system which regulate intestinal ion transport and fluid and electrolyte homeostasis.

We performed Ussing chamber experiments in colonic mucosa-submucosa preparations from adult C57BL/6 male mice and measured short circuit current (Isc) and transepithelial resistance (TER) after serosal administration of Lyso-Gb3 at increasing concentrations to mimic the blood-derived nature of Lyso-Gb3. We also examined the effects of Lyso-Gb3 on secretagogue-induced responses using carbachol, forskolin and the TRPV1 receptor agonist capsaicin which stimulate calcium-, cAMP- and sensory nerve mediated responses respectively. Tetrodotoxin (TTX) was used to assess any potential neuronal component of Lyso-Gb3-induced changes.

Baseline Isc significantly increased when 3 μ M Lyso-Gb3 was applied (Δ IscDMSO, -0.23 ± 0.27 μ A.0.12cm⁻² versus Δ IscLyso-Gb3, 0.82 ± 0.24 μ A.0.12cm⁻²; $p < 0.05$). This response was insensitive to TTX pre-treatment. At concentrations $\leq 1\mu$ M or 10μ M, Lyso-Gb3 had no significant effect on baseline Isc. Pre-incubation with 3 μ M Lyso Gb3 (30 min) significantly increased capsaicin-mediated responses. 3 μ M Lyso-Gb had no significant effects on TER, carbachol- or forskolin-induced changes of Isc.

Lyso-Gb3 significantly influences colonic ion transport, and selectively increases sensory-nerve mediated responses, which may contribute to the dysregulation of intestinal function in FD patients.

64. Maternal morbidity and mortality: an iceberg phenomenon

Leitao S¹, Manning E¹, Greene R¹, Corcoran P¹

¹National Perinatal Epidemiology Centre, UCC

Objective

Apply the iceberg model, quantifying absolute and relative incidence, to the four main causes of maternal morbidity and mortality in Ireland: haemorrhage, hypertension, sepsis and thrombosis.

Population or Sample

Approximately 600,000 maternities, 1,200,000 maternal hospitalisations, 1,584 cases of severe maternal morbidity (SMM) and 49 maternal deaths.

Methods

Secondary analysis of national data on maternal morbidity and mortality. Incidence rates and case-fatality ratios were calculated.

Main Outcome Measures

Maternal death, SMM and hospitalisation.

Results

At the 'tip of the iceberg', the incidence of maternal death per 10,000 maternities was 0.08 due to thrombosis, 0.03 due to haemorrhage, 0.02 due to hypertension disorders and 0.02 due to sepsis. For one death due to thrombosis there were 26 cases of pulmonary embolism and 346 thrombosis hospitalisations. For one death due to eclampsia, there were 76 eclampsia cases, 23,812 hospitalisations with pre-existing hypertension and 89,438 hospitalisations with gestational

hypertension. For one death due to pregnancy-related sepsis, there were 122 cases of septicaemic shock and 16,928 hospitalisations with obstetric sepsis. For one maternal death due to haemorrhage, there were 629 cases of major obstetric haemorrhage and 58,168 maternal hospitalisations with haemorrhage. For every 100 maternities, there were approximately 20 hospitalisations associated with haemorrhage, 15 associated with hypertension disorders, three with sepsis and 0.3 with thrombosis.

Conclusions

Haemorrhage and hypertension disorders are leading causes of maternal morbidity in Ireland but they have very low case fatality. This indicates that these morbidities are managed effectively but their prevention requires more focus.

67. Implementation of an ISO15189 accredited Next Generation Sequencing service with the Ion Torrent Genexus: The experience of a clinical diagnostic laboratory.

Werner R^{1,2}, Burke L^{1,2}, Hand C², Bennett W¹, Connolly A¹

¹*Department of Pathology, University College Cork*, ²*Pathology Department, Cork University Hospital*

Introduction: Implementation of an ISO15189 accredited, Next Generation Sequencing (NGS) service in a clinical diagnostic laboratory with no previous NGS experience, was due to the following:

- Targeted therapy increased clinical demand for timely tumour sequencing.
- Compliance with best practice guidelines for cancer diagnostics.
- Limited tissue availability; NGS can assess multiple genes on single specimens.

Method: This project involved (1) evaluation of automated methodologies for sample preparation, sequencing and reporting, (2) optimisation and validation of a targeted panel on clinical tumour samples from sample to reporting, (3) establishing an accredited NGS service onsite to reduce turnaround times of NGS results to clinicians. The novel Ion torrent Genexus™ sequencer was selected with Oncomine Precision Assay™ utilising the Oncomine Reporter™ software to analyse 78 variants including mutations, copy number variations and fusions across 50 key genes. Verification involved 181 assays on previously characterised formalin fixed paraffin embedded clinical samples including surgical resections, biopsies, cytology, and contrived reference material (n=181). Key assessment parameters included analytical sensitivity, specificity, limit of detection, accuracy, repeatability, and reproducibility, with the establishment of in-house performance metrics and quality parameters.

Results: High sensitivity, specificity and reproducibility achieved. DNA/RNA input requirements optimised to >10ng/μl, and sequencing performance established with a limit of detection of 5% when depth of coverage of 2500X was reached. This service attained ISO15189 accreditation with no non-conformances and >47% reduction in turnaround times.

Conclusion: Successful implementation, clinical validation and ISO15189 accreditation of a novel fully automated NGS workflow, with an improved turnaround time of results to Oncologists.

70. Do Menopausal Symptoms Impact Occupations/ADLs For Women In Ireland?

O'Brien K¹, Fenlon E¹, Pennisi Y¹

¹*University College Cork*

Purpose: The impact of menopausal symptoms on everyday occupations is an emerging area of healthcare. Women typically experience menopause as part of the ageing process, from around 40 to 50 years. Many women report disruption to multiple areas of their lives, due to symptoms. Currently, no literature exists, from an occupational therapy perspective examining the impact of menopausal symptoms on women's everyday activities.

Aim: To ascertain the prevalence of menopause symptoms and describe how they may impact daily occupations. To establish a baseline of the impact of menopausal symptoms on women in Ireland and add to occupational therapy/occupational science (OT/OS) literature.

Method: Cross-sectional design using an online survey was used to gather quantitative data regarding the impact of menopausal symptoms on activities of daily living. Descriptive statistical data analysis methods were used to examine the data.

Participants: 69 respondents completed the electronic survey. These were women living in Ireland currently experiencing menopausal symptoms and recruited through gatekeepers from online menopausal groups and menopause specific clinics.

Results: Somatic and psychological symptoms have the most significant impact on women during this transitional life-stage. The most impacted areas are productivity, sleep & rest, sexual intimacy, leisure and social participation. Fatigue, poor sleep, joint pain and anxiety were the most disruptive symptoms experienced by participants.

Conclusion: Findings of this exploratory study demonstrate that somatic and psychological symptoms are reported as most disruptive to everyday occupations. These areas suggest that OTs may have a role to play in supporting women in this transitional life-stage.

72. Association of preoperative and postoperative circulating tumour DNA (ctDNA) with PIK3CA gene mutation with risk of recurrence in patients with non-metastatic breast cancer.

Hassan F^{1,2}, Huai Wang J¹, Corrigan M^{1,2}, Redmond H^{1,2}

¹*University College Cork*, ²*Cork University Hospital*

Precise biomarkers of recurrence for postoperative risk stratification of non-metastatic breast cancer, remain elusive. Circulating tumour DNA (ctDNA), which contains tumour-specific gene mutation is usually detected in circulation. In this study, we investigated the feasibility of detecting PIK3CA gene mutations in ctDNA in the preoperative (preop) and postoperative period (postop), and its prognostic significance in patients with breast cancer.

Methods

In this study, cohort of patients with breast cancer with paired blood samples in preop and postoperatively (PO) at either of PO time point; PO week 1-2, PO week 3-4 and PO weeks 5-12 were

analysed. PIK3CA gene mutations at exons 9 and 20 were detected in ctDNA with High resolution melting (HRM) PCR and Allele specific probe-based PCR.

Results

In cohort of 62 patients (age, median (IQR), 51.50 (45.0-65.0) years), with a median follow-up of 90 months (interquartile range (IQR), 60-120 months), significant association was observed between detectable postop ctDNA and risk of recurrence in patients with breast cancer. In total, 25 (40.3%) and 22 (35%) patients with breast cancer had detectable PIK3CA mutations in ctDNA in preop and postop period, respectively. Cox hazard model analysis revealed that PIK3CA mutations in postop period (hazard ratio (H.R): 18.05, $p=0.001$) were negative prognostic factor for recurrence-free survival (RFS) and overall survival (O.S) (H.R: 11.9, $p=0.01$) in patients with breast cancer with an average lead time of 12.00 months (IQR:20-28.5 months).

Conclusion

Our study highlighted the prognostic ability of ctDNA in patients with breast cancer as prognostic biomarker for RFS and O.S.

75. The Role of the Nurse in Patient Focused Research during COVID-19- How in putting patient needs first, this study was completed.

Lynch N¹, Mulcahy T

¹Health innovation Hub Ireland

COVID-19 disrupted clinical practice on an unprecedented scale, with many research initiatives stalled or terminated. Nevertheless, nurses worldwide continued their vocation of caring and working with patients. This poster explores the role of the nurse in enabling research studies and patient care to continue during these extraordinary times, it calls out the resilience of nurses within a UCC and Cork hospitals project and how consideration for patients and their care during COVID ensured that the study was completed.

Patients with ileostomies are required to visit stoma clinics to manage their stoma and skin complications. A new (Irish) CE marked product 'Ostoform' had shown significant improvements in patients with skin complications during clinical studies. In Ireland, public patients can only be prescribed products on the HSE Primary Care Reimbursement Service list, approval requires an end-user feedback study and publication of results. The study delivered through HIHI, UCC, was due to commence in January 2020 with patients to be enrolled while attending stoma clinics in CUH and MUH. In March 2020 stoma clinics stopped all patient visits.

Taking a human-centred design approach and working within HSE Covid guidelines, a novel care pathway was designed to provide remote care to the patients and deliver the study. We discuss "how" a nurse within the HIHI team fostered connections with these vulnerable patients and delivered the study using this novel care pathway. The role of the research nurse was invaluable in ensuring patient needs were addressed and by doing so, the study was completed.

88. An Investigation into the Impact of Dietary Additives on Epithelial Cell Responses and Inflammation

Saiz-Gonzalo G¹

¹*APC Microbiome UCC*

Inflammatory bowel disease (IBD), encompassing ulcerative colitis and Crohn's disease, is a term for a chronic multifactorial condition that affects the intestines with unknown aetiology and with increasing cases worldwide. There is currently no cure for IBD and treatment is limited. The microbiota and westernised diet are suggested to contribute to the disease in IBD patients. In recent years, certain dietary additives e.g., emulsifiers and sweeteners have been implicated in the deterioration of IBD conditions in experimental models by negatively impacting both the intestinal microbiota and the subsequent host response. Recent evidence in mice showed that low concentrations of these emulsifiers can disturb the host-microbiota relationship inducing low-grade inflammation and metabolic syndrome in wild-type and promoting colitis in predisposed mice. It is currently unknown how dietary additives alter the gut microbiota, and the host response, of IBD patients. Thus, the aim of this project is to investigate the impact of food additives on human IBD microbiota. My focus has been on unravelling the cell death mechanism(s) regulated by polysorbate 80 (p80) by using small molecule inhibitors targeting apoptosis, necrosis, autophagy and ferroptosis. My results indicate that the emulsifiers, especially polysorbate-80, provoke alterations in metabolism proliferation, cell death and cytokine response in epithelial cells. In conclusion, our data suggest that these emulsifying agents might contribute to the increased incidence of chronic conditions and metabolic syndrome by altering cell microbial responses.

90. Development of a flow-cytometry-based platform for multiparametric analysis of systemic immune-metabolic dysregulations of pregnancy

Musumeci A¹, McElwain C¹, Manna S^{1,2}, McCarthy F², McCarthy C¹

¹*Department of Pharmacology and Therapeutics, School of Medicine, University College Cork,*

²*Department of Obstetrics and Gynaecology, Cork University Maternity Hospital*

Pre-eclampsia (PE) and gestational diabetes mellitus (GDM) are common complications of pregnancy associated with adverse outcomes for both mothers and babies. PE and GDM share many risk factors, and often clinically present together. The increased prevalence of both complications is in line with the global obesity epidemic. The prominent metabolic and inflammatory pathogenesis of both complications suggests the existence of regulatory axes between placenta and adipose tissue, an important regulator of meta-inflammation. Therefore, it is important to understand the underlying mechanisms of immune-metabolic alterations and both local and systemic communication networks.

We have developed a flow-cytometry-based platform for the simultaneous analysis of multiple parameters across four different biological specimens, with the potential to highlight and cross-validate both local and systemic alterations. We assess the frequency and functional status of T-cells, Monocyte-Macrophages-Dendritic Cells and Natural Killer cells across placenta, cord blood, maternal peripheral blood and visceral omental adipose tissue. In addition, structural and functional mitochondrial-specific staining can be included, to evaluate oxidative stress within cell populations. All samples obtained in our study are from nulliparous pregnant women at or near term who are undergoing elective Caesarean-section delivery. This facilitates the exclusion of confounding factors such as previous immunological memory and placental inflammation associated with vaginal

delivery. In addition to conventional flow cytometry analysis, based on biparametric gating, the large number of parameters acquired allows the implementation of bioinformatics analyses, for the unsupervised clustering, evaluation and detection of significant pathological drivers that might be hidden in the complexity of the system.

92. Developing in vitro lipolysis model for real-time analysis of drug concentrations during digestion of lipid-based formulations

Ejskjær L¹, O'Dwyer P¹, Kuentz M⁴, Holm R^{2,3}, Griffin B¹

¹*School of Pharmacy, University College Cork*, ²*School of Life Sciences, University of Applied Sciences and Arts Northwestern Switzerland*, ³*Department of Physics, Chemistry and Pharmacy, University of Southern Denmark*, ⁴*Drug Product Development, Janssen Research and Development Johnson & Johnson*

For poorly soluble drugs, which represent up to 80% of all small drug molecules in modern development pipelines, Lipid-Based Formulations (LBF) are an attractive enabling technology to enhance oral bioavailability for such drugs. In vitro lipolysis assays have been developed to study the impact of LBF digestion on formulation performance, predominantly using crude porcine pancreatin extract as the lipase. However, the presence of porcine pancreatin extract hampers the in-line analytical opportunities for monitoring drug concentration in real time, resulting in slower and resource intensive off-line analysis. The objective of this study was to reengineer the current in vitro lipolysis model by redefining the digestion conditions with the goal of developing in-line UV measurements to monitor drug concentrations in real time during formulation digestion.

The pH-stat setup was used to maintain the pH during digestion by continuous titration with NaOH. A range of lipases was explored to assess digestion of a long-chain and medium-chain LBF, including pancreatin, immobilized lipases (from *Candida Antarctica B*, *Rhizomucor miehei*, and *Thermomyces lanuginosus*), and liquid lipases (from *Candida Antarctica A* and *B*, *Rhizomucor miehei*, and *Thermomyces lanuginosus*).

The results indicated that the sn-1,3 specific lipases offered a comparable extent of digestion and similar digestion kinetics compared to the crude pancreatin extract, whereas the non-specific lipases did not yield any comparable digestion. These lipases offer the advantages that they can be easily integrated for in-line UV analysis. Further studies will be explored to investigate which of these can facilitate in-line and bio-predictive evaluation of lipolysis.

95. The association between self-reported sensory function (vision and hearing) and cognitive function. Results from the Irish Longitudinal Study on Aging (TILDA)

O'Leary E¹

¹*Department of Speech and Hearing, School of Clinical Therapies, College of Medicine and Health, University College Cork*

Background: With an aging population worldwide and in Ireland, comes more age-related health problems, including problems with hearing, vision, and a gradual decline in some cognitive functions. Sensory impairments (both hearing and vision) have been shown to have an association with cognitive impairment, with a greater cognitive decline seen in those with a combined hearing

and vision loss. No study to date has looked at similar data collected in Ireland. The objective of this study is to analyse data from an Irish sample.

Method: This study uses data collected from the Irish Longitudinal Study on Aging (TILDA).

Participants with missing data or information were excluded, leaving a complete dataset of 4612, for analysis. Statistical analysis was carried out to compare mini mental state examination (MMSE) scores to self-reported sensory impairment (hearing impairment alone, vision impairment alone and dual sensory impairment (DSI)) while adjusting for several covariates (age, gender, level of education, alcohol consumption, depression, smoking history, mobility, loneliness, and physical activity).

Results: Self-reported fair or poor hearing and self-reported fair or poor vision had statistically significant (P-value <0.05) lower MMSE scores than participants with self-reported excellent, very good or good hearing and self-reported excellent, very good or good vision respectively. Self-reported DSI was associated with lower MMSE scores compared to participants without DSI.

Conclusion: This study demonstrated that in older Irish adults there is an association between hearing impairment, vision impairment and dual sensory impairment and lower cognitive function. These findings contribute to the growing body of research done internationally.

102. LYSA Trial - The Dietetic Intervention Component for a Women Cancer Survivorship Pilot Clinic.

Cushen S¹, Davis A², Bermingham K², Byrne F², O'Grady A², O'Neill D², O'Connell K^{3,4}, Raigal-Aran L⁴, Kerns N⁵, Flynn N⁵, O'Reilly S^{3,4,6}, Corrigan M⁷, Coulter J^{8,9}, Cleary V^{3,8}, Collins D³, Flavin A¹⁰, Murphy A¹¹, Dahly D^{12,13}, Palmer B^{12,13}, Connolly R^{3,4}, Hegarty J⁵

¹*School of Food and Nutritional Sciences, University College Cork,* ²*Department of Nutrition and Dietetics, Cork University Hospital,* ³*Department of Medical Oncology, Cork University Hospital,,* ⁴*Cancer Research @UCC, College of Medicine and Health, University College Cork,,* ⁵*Catherine McAuley School of Nursing and Midwifery, University College Cork,,* ⁶*Department of Medical Oncology, South Infirmity Victoria Hospital,* ⁷*Department of Academic Surgery, Cork University Hospital,,* ⁸*Department of Gynaecology Oncology, Cork University Maternity Hospital,* ⁹*Department of Gynaecology Oncology, South Infirmity Victoria Hospital,,* ¹⁰*Department of Radiation Oncology, Cork University Hospital,,* ¹¹*Department of Economics, Cork University Business School,* ¹²*HRB Clinical Research Facility - Cork, University College Cork,,* ¹³*School of Public Health, University College Cork,*

Background: Uncertainty related to dietary choices and/or change in body composition can be distressing for female cancer survivors, and may impact on long term disease-free survival and reduce quality of life (QoL). To help address this gap, the Irish Cancer Society's Women's Health Initiative is supporting pilot studies of survivorship clinics in Dublin and Cork.

Methods: The LYSA (Linking You to Support and Advice) study is a single centre randomized controlled trial assessing the feasibility of introducing a nurse-led multidisciplinary pilot clinic in Cork University Hospital, for women with HR-positive breast and gynaecologic cancer post primary curative therapy (NCT05035173, n=200). Those in the intervention arm undertake electronic patient reported outcome (ePRO) assessment at baseline, and 2, 4, 6, 8, 10, 12 months. The control group receives usual care alone. It also entails a dietitian-led component which uses an individualised approach at promoting optimal dietary intake, improving patient weight, physical function and nutrition related symptoms. Dietary intake is assessed using 24-hour dietary recalls and food

frequency questionnaires. Dietary quality is measured using the World Cancer Research Fund/American Institute for Cancer Research standardized scoring system. Anthropometry, body composition and muscle strength are also recorded.

Discussion: Ethical approval was granted in December 2020, with accrual commencing March 2021. At the time of abstract submission, 145/200 patients were enrolled. Early lessons learned in the development and implementation of the dietetic intervention will be presented.

103. Potential alcohol use disorder among MSM in Ireland - Findings from the European MSM internet survey (EMIS 2017).

Daly F^{1,2}, O'Donnell K³, Davoren M^{2,4}, Noone C⁵, Weatherburn P⁶, Quinlan M⁷, Foley B⁷, Igoe D³, Barrett P^{2,8}

¹School of Medicine and Health, University College Cork, ²School of Public Health, University College Cork, ³HSE Health Protection Surveillance Centre, ⁴Sexual Health Centre, ⁵School of Psychology, National University of Ireland Galway, ⁶Sigma Research, London School of Hygiene and Tropical Medicine, ⁷Gay Health Network, ⁸Department of Public Health HSE-South, St. Finbarr's Hospital

Background

Alcohol consumption is a major public health concern in Ireland. Alcohol use disorder (AUD) disproportionately affects men who have sex with men (MSM). However, little is known about the prevalence of AUD in this group in Ireland specifically, and the characteristics of MSM who may struggle with this.

Methods

The European MSM Internet Survey 2017 was an online, self-completed, anonymous questionnaire among MSM in Ireland. Standardised questions were used to explore a variety of topics. The validated CAGE-4 questionnaire was used to screen for potential AUD, defined as a CAGE-4 score of ≥ 2 out of 4. Multivariable-adjusted logistic regression was used to identify factors associated with potential AUD.

Results

In total, 1793 MSM met inclusion criteria. 31% screened positive for AUD. We observed higher odds of possible AUD among MSM who were bisexual (vs. gay/homosexual) (aOR 1.48 95%CI 1.01-2.18), native to Ireland (vs. non-native) (aOR 1.49 95%CI 1.12-1.96), unemployed (vs. employed) (aOR 1.80 95%CI 1.02-3.16), had used illicit drugs in the previous year (vs. none) (cannabis only, aOR 1.74 95%CI 1.14-2.63) (other illicit drugs, aOR 2.28 95 %CI 1.67-3.09), reported anxiety/depression (vs. none) (aOR 1.73 95%CI 1.12-2.66), and MSM who experienced homophobic abuse (vs. never) (aOR 1.55 95%CI 1.09-2.22). Student MSM were less likely to screen positive for AUD (vs. employed) (aOR 0.65 95%CI 0.46-0.93).

Conclusions

The prevalence of AUD appears to be higher in the MSM population compared to the general male population in Ireland. Targeted interventions may be warranted to reduce the burden of AUD among MSM.

112. Nebulization of siRNA-containing lipid-based delivery vectors produced by microfluidic mixing

Neary M¹, Mulder L¹, Lopez Espinar A¹, Kowalski P¹, Ryan K¹

¹*School of Pharmacy, University College Cork*

Small interfering RNA (siRNA) has enormous therapeutic potential owing to its ability to inhibit gene expression via the phenomenon of RNA interference. Nebulization is an attractive delivery method as it can deliver large doses of aerosolized drug during tidal breathing. The aim of this study was to investigate the impact of nebulization on the physical properties (size and encapsulation efficiency) of several siRNA-containing liposomal and LNP formulations. Three formulations were produced with a microfluidic staggered herringbone mixer: 1) non-PEGylated liposomes comprised of DOTAP:Cholesterol, 2) PEGylated liposomes (DOTAP:Cholesterol: DMPE-PEG2000) and 3) LNPs (C12-200:Cholesterol: DSPC: DMPE-PEG2000). Negative control siRNA was encapsulated at a nitrogen: phosphate ratio of 5:1. Samples were nebulized using an Aerogen Pro Nebulizer and were tested prior to and post nebulization for size and encapsulation efficiency. The average size of the non-PEGylated liposomes was found to be considerably larger than the other two formulations demonstrating the important role of a PEG-lipid in helping to achieve an appropriately small particle size. Nebulization had a significant impact on all three formulations resulting in a notable increase in both size and PDI. The LNPs displayed desirable characteristics with an approximate size of 82 nm or less, a maximum PDI of 0.24 and remained of a sufficiently small size post nebulization for siRNA delivery (<200 nm). The siRNA encapsulation efficiency of all three formulations was high at $\geq 98\%$. Post nebulization encapsulation efficiency was $\geq 78\%$ demonstrating that the lipid carriers remained sufficiently stable during nebulizing to retain a large proportion of their siRNA cargo.

115. Implementing voluntary or mandatory food marketing codes in European countries to protect children and adolescents' health and rights: process and challenges.

Contreras Navarro A¹, Harrington J, Perry I, O'Dwyer U, Bica M, Gregório M, Tatlow-Golden M, Muc M

¹*University College Cork*

Since the endorsement of the World Health Assembly Resolution (WHA63.14) to restrict the marketing of foods high in fats, sugars, and salt, thirty-one countries have developed or updated a national code of practice for food businesses to follow when advertising to children and adolescents. However, marketing practices that are harmful to children's and adolescents' health and rights remain pervasive across all settings in most countries. In the European region, the Joint Action Best-ReMaP seeks to provide tools to twelve participating European Union Member States to test best practices (BP) in food marketing codes. Ireland is co-leading the food marketing Work Package together with Portugal. The Irish team, based in the School of Public Health, University College Cork, prepared a technical guidance report for consultation by participating EU MS prior to a workshop organised on 16th March 2022. Guidance was based on a critical comparison of existing codes from Ireland, Portugal, and Slovenia, against a specialized toolkit developed by the European Commission's Joint Research Centre. Elements of BP and challenges were outlined in the report and further discussed in the workshop. Six recommendations for immediate action to reduce the marketing of unhealthy foods to children were proposed: 1) protecting all children up to 18 years of age, 2) defining nutritional criteria, 3) covering all settings and marketing techniques, 4) developing monitoring tools, 5) building capacity at the national level and 6) coordinating action. In 2022-2023, Ireland will continue to collaborate with EU MS to implement BP in food marketing codes.

117. Effects of prebiotics on post-partum stress resilience: Implications for post-partum depression and anxiety disorders.

Villalobos-Manriquez F^{1,2}, Csatlosova K^{1,2}, Cryan J^{1,2}, O'Leary O^{1,2}

¹*Department of Anatomy and Neuroscience*, ²*APC Microbiome Ireland, University College Cork*

Depression is a neuropsychiatric disorder characterised by a negative impact on mood. The causes of depression are not yet fully understood but stress is a risk factor. Accumulating evidence suggests that the gut microbiota are involved in stress-induced depression and anxiety-like behaviors and can regulate neurogenesis (the production of new neurons) in the hippocampus. This suggests that manipulating gut microbiota has therapeutic potential. However, most preclinical studies have been conducted in males only, despite the fact that women are two times more likely to develop depression compared with men. Women are also uniquely vulnerable to postpartum depression but pregnant or lactating females are rarely studied, and the roles of the gut microbiota in maternal vulnerability to stress during the postpartum period have not yet been investigated. Thus, this project aims to investigate the impact of postpartum stress on depressive, anxiety and social behaviours and to

determine if supplementation with the prebiotics, FOS+GOS, can prevent the effects of post-partum stress.

Upon pregnancy, female mice were injected with BrdU to label newly born neurons and were given FOS+GOS in their drinking water. After giving birth, the limited bedding and nesting paradigm (a stressor that simulates an impoverished environment) was applied during post-partum (PPD) days 4-11. Beginning on PPD21, the mother underwent behavioural tests of depression, anxiety and social behaviour.

Preliminary data suggests that post-partum stress and FOS+GOS alters some of these behaviours. Further experiments are currently underway increasing sample size to confirm our preliminary findings.

118. Evaluating diagnostic approaches to cachexia in a dietitian-led multimodal cancer cachexia intervention in metastatic cancer (CACHEXIA-CARE).

Sullivan E^{1,2}, Scannell C^{1,2}, Power D^{2,3}, Ryan A^{1,2}

¹School of Food and Nutritional Sciences, College of Science, Engineering and Food Science, University College Cork, ²CancerResearch@UCC, University College Cork, ³Department of Medical Oncology, Mercy University Hospital

Introduction: The management of cancer cachexia (CC), remains challenging due to its multifactorial aetiology. Efficacy of multimodal interventions is still expected to be poor in advanced CC, but there is no validated means of identifying patients early in the CC trajectory who might benefit from such interventions. This study aims to examine methods to identify patients likely to benefit from multimodal intervention.

Methods: This RCT will recruit 70 patients with incurable pancreatic, oesophageal, gastric or lung cancer due to begin first-line systemic treatment. Patients will be randomised 1:1 (open-label) to intervention or control. The personalised 12-week multimodal intervention delivered by a dietitian includes dietary counselling, symptom management, exercise prescription and 2 daily servings of a novel powdered oral nutritional supplement for reconstitution with a nutrient profile designed to optimise muscle protein synthesis. The control group receive no routine dietetic input. All patients receive standard oncological care and written resources on diet and cancer. Comprehensive nutrition and functional assessments will be conducted at baseline, weeks 2, 4, 8 and 12. The assessments will incorporate routine anthropometry, biochemistry, nutrition focussed physical exam, bioelectrical impedance, timed up and go test and CT body composition analysis (baseline and week 12 only).

Results: A secondary analysis will identify which assessment methods or diagnostic criteria can identify cachexia early in the trajectory and whether these predict which patients respond to the intervention.

Conclusions: This RCT will examine the validity of currently available assessment techniques in appropriate selection of patients with potential to benefit from such interventions.

128. Interleukin (IL)-6 impairs progenitor cell proliferation and alters subsequent neuronal and glial differentiation during cortical neural stem cell development in vitro.

Deady C^{1,2}, Mazzocchi M¹, McCarthy C³, McCarthy F⁴, O'Mahony S^{1,2}, O'Keeffe G^{1,2}

¹*Department of Anatomy & Neuroscience*, ²*APC Microbiome Ireland*, ³*Department of Pharmacology & Therapeutics*, ⁴*Department of Obstetrics and Gynaecology*

Pre-eclampsia is a serious hypertensive disorder of pregnancy that can alter brain structure in exposed offspring. The molecular mediators are unknown but may involve maternal inflammation. Interleukin-6 (IL-6) is a pro-inflammatory cytokine that is significantly elevated in women with pre-eclampsia. We hypothesised that exposure of embryonic cortical neural progenitor cells (NPCs), which generate neurons and glia in the developing brain, to IL-6 would alter their proliferation and or differentiation. NPCs from embryonic day 18 rat cortices were proliferated as neurospheres in media containing 20ng/ml EGF and FGF2 for 7 days (proliferation). 1% serum was added to induce differentiation for 7 days. 20ng/ml IL-6 was added on day 1, 3 and 5 during proliferation and or differentiation. Neurosphere number and diameter were assessed during proliferation, and β -III tubulin (neurons), and GFAP (astrocytes) expression was assessed by densitometry following 7 days differentiation. Treatment with IL-6 increase neurosphere number at day 4 and 7 while the diameter of individual neurospheres in the IL-6 group was smaller at day 2, 4, and 7 of the proliferation phase. Treatment with IL-6 during proliferation and or differentiation, did not alter cell migration from the neurospheres, but led to a reduction in the expression of Beta-III tubulin and GFAP. Whether this is due to IL-6-induced cell death, oligodendrocyte differentiation or maintenance of an NPC state is not known. These findings rationalise the further investigation of IL-6 as a potential mediator of the effects of pre-eclampsia exposure on brain structure in exposed offspring.

129. Film coated colonic drug delivery systems for site specific delivery: in vitro assessment of drug release

Giakoumis T¹, Curan G, O'Driscoll C, O'Shea J, Griffin B

¹*University College Cork*

Colonic drug delivery is an effective means to achieve site specific targeting of therapeutics to treat local disease within the large intestine, including Inflammatory Bowel Disease and colorectal cancer, while also offering the potential of systemic uptake. Despite continual efforts to formulate effective colonic drug delivery systems, optimal formulations that target drug release efficiently and reproducibly to the colon are still lacking. Currently available colon-targeting formulations based on pH-sensitive or time-dependent drug release suffer from an inconsistent performance due to intra- and interindividual (patho)physiological variability. Nonetheless, efficient, targeted, sustained release from multiparticulate systems in the colon remains a promising means for enhancing therapeutic outcomes. The present study aims to assess in vitro release from under simulated intestinal conditions to determine the viability of film coated pellets to target drug release to the colon. Ethylcellulose was chosen as a, time-controlled, pH-independent polymer system in two commercially available forms: aqueous (Surelease®) and organic (Ethocel™) dispersions. Theophylline was chosen as a model compound, and pelleted with microcrystalline cellulose via extrusion-spheronization. Pellets were subsequently coated with ethylcellulose film coatings using a fluidized bed coater. Drug release from uncoated and coated pellets was determined under simulated intestinal conditions in USP I dissolution apparatus (basket), followed by quantification via HPLC-UV. Results showed that both film coaters achieved a sustained

release relative to the uncoated pellets, with the organic Ethocel™ coating demonstrating a stronger film coating compared to the aqueous Surelease®. This effective film coating could be attributed to the higher amount of ethylcellulose present in Ethocel™.

136. Microbiome profiling for the stratification of cancer patients

Devoy C¹

¹*University College Cork*

Multiple studies, both pre-clinical mouse studies and human patient clinical trials, have found that the gut microbiota can influence treatment outcome of cancer immunotherapies. At present there is no consensus on what constitutes a “good microbiota”. This clinical study of cancer patients undergoing immune checkpoint inhibitor treatment ICI or chemotherapy at a number of different centres throughout Ireland hopes to further elucidate this interaction between the gut microbiota and treatment outcome. 16s sequencing of gut microbiota (stool) from each patient at a number of time points pre, post and during treatment will contribute to the development of ‘microbial maps’ of different patient groups, with the aim of informing selection of cancer therapy responders based on personal microbiome profiles in the future. This could also potentially allow for concomitant treatment of patients undergoing ICI with the introduction of bacterial species found to be beneficial in patients that were deficient.

137. How blogs support the transfer of knowledge into practice in the field of dementia palliative care: a survey of facilitators and barriers

Rukundo A, Fox S, Guerin S, Kernohan G, Drennan J, O'Connor N, Timmons S

¹*Centre for Gerontology and Rehabilitation, School of medicine*

Background:

Blogging can help to maximise the impact of one’s work in academia and beyond by making research findings accessible for multiple knowledge users. As part of the knowledge exchange and dissemination activities of the Model for Dementia Palliative Care Project, this study explored stakeholders’ views of blogs as a means to translate research findings in the field of Dementia Palliative care.

Methods:

A web-based survey was developed, piloted, and revised. It was distributed electronically via key dementia and palliative care organisations. Complete responses (N=128) were received from healthcare researchers (n=53), healthcare providers (n=46) and others with an interest in healthcare research (n=29). Data were analysed using descriptive statistics and content analysis.

Results:

The preferred methods of reviewing research findings were scientific papers, websites and news articles. Respondents read healthcare blogs “sometimes” (39.1%), with <19% reading them “often” or “very often”. Receiving an email notification might increase the likelihood of reading a new blog post for 83% of respondents. Barriers to engaging with blogs included

lack of time, preference for other media, lack of awareness regarding available blogs, and concerns about the credibility and source of information. An appropriate length and the author of the blog were key features that encouraged engagement with a blog. Most respondents (33.6 % 'Yes' and 30.3% 'Maybe') would share Dementia Palliative care blogs by the research team.

Conclusion:

Despite respondents choosing a scientific paper as their preferred method to consume research findings, many indicated an openness to reading blogs on their area of interest.

138. The Immune Profile of the Microbiome, an exploration the small and large bowel

O'Sullivan A^{1,2}, Lavelle A^{1,2,3}, O'Leary D¹, Crowley B¹, Fanning L^{1,2}

¹*Department of Medicine*, ²*APC Microbiome Ireland*, ³*Department of Anatomy and Neuroscience*

Introduction

The interactions between bacteria and the mammalian immune system have been studied in far more detail to date than interactions between the phageome and the immune system. Bacteriophage (phage) have been shown to interact with the human immune system in a variety of ways- inducing antibody production, inducing host T-cell production and phagocytosis. The phageome of the small bowel is poorly described.

Aim

We aimed to describe both the bacterial and viral (phage) gut microbiomes of colonic (n=11) and small bowel populations (n=8). We aimed to demonstrate the existence of a set of viruses which interact with the human host immune system, specifically via production of immunoglobulin A.

Materials and Methods

16S rRNA sequencing was utilised to characterise the bacterial microbiome. DNA containing phage were isolated using a chloroform and PEG precipitation preparation and subsequently sequenced via shotgun metagenomic sequencing. IgA-associated phage were identified by their ability to bind to an antibody complex.

Results

Preliminary results suggest a sub-population of phage may be associated with antibody response and marked differences in microbial density between the small and large intestine.

Conclusion

Here we present ongoing work describing the small bowel bacteriome and virome of 8 patients living without colons and contrast this with individuals with an intact gastrointestinal tract.

139. Sialic Acid-Targeted Cyclodextrin-Based Nanoparticles for siRNA Delivery to Reprogram Tumour-Associated Macrophages in Prostate Cancer in vitro

Sun Y¹, Cronin M¹, Mendonça M¹, Guo J², O'Driscoll C¹

¹*School of Pharmacy, University College Cork*, ²*School of Pharmaceutical Sciences, Jilin University*

Prostate cancer is the second most prevalent cancer in men worldwide. Conventional treatments have disadvantages including poor prognosis and drug resistance. Recently, M2-to-M1 reprogramming of tumor-associated macrophages has emerged as a promising strategy for tumour immunotherapy. This can be achieved by downregulating the expression of Colony-stimulating factor 1 receptor (CSF-1R) mRNA by specifically delivering CSF-1R small interfering RNA (siRNA) to M2 macrophages, thereby, killing prostate cancer cells. Sialic acid is a specific ligand for Siglec-1, an immunoglobulin-like transmembrane protein that is overexpressed on M2 macrophages with little expression in other phenotypes. In this work, sialic acid-targeted β -cyclodextrin nanoparticles (NPs) were used to deliver CSF-1R siRNA. The resulting NPs had a size of 246 ± 16 nm, PDI < 0.3 , and a surface charge of 29 ± 2 mV. Following NPs treatment, 49% of RAW264.7-derived M2 macrophages were FAM positive, and CSF-1R mRNA levels were reduced by $\sim 40\%$ ($p < 0.01$). Additionally, $\sim 35\%$ of the cells expressed the M2 marker (CD206), and the remaining cells ($\sim 65\%$) expressed the M1 marker (CD86), indicating over 60% macrophages were reprogrammed. A co-culture of M2 macrophages and prostate cancer cells (Tramp C1), designed to mimic the in vivo environment was established, M1/M2 cytokines levels and apoptosis of cancer cells were measured. The NPs upregulated the M1 marker ($p < 0.01$), downregulated the M2 marker ($p < 0.01$), causing $> 50\%$ apoptosis of cancer cells. Results indicate the potential of the sialic acid-targeted CD-based NP to specifically deliver siRNA and reprogram M2 macrophages for enhanced prostate cancer therapy.

148. The development and implementation of a real-time suicide surveillance system in South-West Ireland

Benson R^{1,2}, Brunsdon C³, Rigby J³, Corcoran P², Arensman E^{1,2}

¹*School of Public Health, College of Medicine and Health, University College Cork*, ²*National Suicide Research Foundation, World Health Organisation Collaborating Centre for Surveillance and Research in Suicide Prevention, University College Cork*, ³*National Centre for Geocomputation, National University of Ireland Maynooth*

The Suicide and Self-Harm Observatory was developed to obtain minimal data on suspected suicide cases on a real-time basis to inform early identification of emerging suicide clusters, new methods amenable to means restriction measures and locations of concern, as well as timely responses to bereaved individuals, evidence-based policy planning and targeted service provision, with the overall aim of preventing premature mortality. Established in County Cork in 2018 and expanded to County Kerry in 2021, the Observatory routinely and systematically collates data from the Coroners of Counties Cork and Kerry and the HSE Patient Mortality Register based on sixteen variables that capture demographic information relating to the deceased, circumstances of the death, history of abuse and mental health service use. Development of an interactive data visualisation tool with an inbuilt cluster detection feature has been pursued to streamline rapid data interpretation for those key stakeholders for whom the Observatory has been built to serve. In the absence of a live database of all deaths under coronial investigation and two-yearly delays in the release and availability of official national suicide mortality statistics, the Observatory represent the only

source of real-time suicide data in Ireland currently. Findings have been used to inform multiple briefings, as requested by the Department of Health and the HSE National Office for Suicide Prevention on deaths by suspected suicide, particularly meeting an increasing number of requests during the COVID-19 pandemic. Aggregated findings based on rates and characteristic trends of suspected suicide during the pandemic will be presented.

Appendix

Appendix A

Acknowledgement of contributions to delivery of the “from Molecules to People” Research Conference.

Dr. Asma Amamou

Shauna Bell

Dr. Nicola Cornally

Dr. Irina Korotchikova

Dr. John MacSharry

Professor Nicole Muller

Kathryn Neville

Dr. Gabriella Rizzo

Dr. Katie Ryan

Members of the Research Committee, College of Medicine and Health
[RC CoMH members](#)

