5th December 2019

New Horizons in Medical Research
A Scientific Conference organised by the School of Medicine, Research and Postgraduate Affairs Committee, UCC.

Devere Hall, Aras na MacLeinn, University College Cork
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New Horizons Research Conference 2019

Sponsored by the School of Medicine

Welcome Message from the Research and Postgraduate Affairs Committee, School of Medicine, UCC

Dear Friends and Colleagues,

On behalf of the School of Medicine’s Research and Postgraduate Affairs Committee (RPAC, Appendix 1), it is with great pleasure that I welcome you all to the New Horizons Research Conference 2019. This research showcase will provide an opportunity to enjoy presentations on a diverse range of clinical and translational medical research projects completed across the School of Medicine. It will enable students and staff to discuss the latest research in medical sciences, with contributions from staff, undergraduate and postgraduate scientists at the forefront of developments in their areas. The programme includes a stimulating mixture of oral and poster presentations, in addition to plenary lectures by prominent clinician scientists and academic staff from within the School of Medicine. The event has been awarded five CPD credits from the RCPI (*page 3). The meeting presents an opportunity to boost strategic growth of the research lead curriculum development agenda. We hope that all of today’s participants, students and staff enjoy the conference programme, as well as the hospitality of University College Cork during the event.

RPAC would like to extend its deep gratitude to Emma O’Reilly whose immense contribution and support have assured the professional delivery of the New Horizons Research Conference.

RPAC would also like to express its gratitude to all those who presented, to those who participated in judging the oral and poster presentations and to those who chaired the meeting sessions:

- Dr. Yvonne Nolan
- Dr. Gerard Clarke
- Prof. Mary Cahill
- Dr. Colm O’Tuathaigh
- Dr. Collette Hand
- Dr. John MacSharry
- Dr. Deryla O’Malley
- Dr. Catherine Sweeney
- Dr. Gabriella Rizzo
- Prof. Colin Bradley
- Dr. Aileen Houston

Yours sincerely,
Liam J. Fanning, Ph.D., D.Sc.
Chair, School of Medicine Research & Postgraduate Affairs Committee, UCC
https://www.ucc.ie/en/medical/research/committee/
Don’t forget to mention #newhorizonsucc on your social media
Operational Information

* CPD credits from the RCPI (Appendix 2)

Full credits can only be awarded to registered attendees who sign in prior to session 1 and session 3 and, return a completed meeting survey to som.horizons@ucc.ie or School of Medicine Office 2.59, Brookfield Health Sciences Complex, College Road, Cork, T12 K8AF.

- The meeting survey will be available from the registration desk during Lunch, (12.40pm – 1.40pm).

Acknowledgements

RPAC would like to extend its appreciation to Mr Paul Pavey and the team at Byte Sized Solutions, UK for their assistance in facilitating the abstract submission/review processes for the New Horizons Research Conference.

Please note that Byte Sized Solutions is committed to observing GDPR regulations and will delete all data concerning to New Horizons on 31st December 2019.

Athena Swan

“The Athena SWAN Charter recognises and celebrates good practice in recruiting, retaining and promoting women in science, technology, engineering, maths and medicine (STEMM) in higher education. The Charter aims to address gender imbalances in STEMM disciplines, based on the belief that endeavours in these fields will be enriched when they can benefit from the talent of the whole population, and when barriers to progress in academic careers are removed.”

(source: https://www.ucc.ie/en/athenaswan/about/)

In keeping with this ethos, RPAC have endeavoured to ensure the New Horizons Research Conference addresses gender equality at the meeting.
#### New Horizons 2019

**Programme of Events**

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8.00 a.m.</td>
<td>Free registration commences</td>
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<tr>
<td>8.00 a.m.</td>
<td>Hanging of posters in Devere Hall, UCC</td>
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<tr>
<td>8.50 a.m.</td>
<td><strong>Welcome Address:</strong> Dr Liam Fanning, Co-Chair, School of Medicine Research &amp; Postgraduate Affairs Committee, UCC</td>
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### Session 1

**Chairs: Dr Yvonne Nolan and Dr Gerard Clarke**

<table>
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<tr>
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<tr>
<td>9.00 a.m.</td>
<td>Dr Sharon Lambert, Applied Psychology</td>
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<tr>
<td></td>
<td><strong>Working Title:</strong> “Research on primary and secondary traumatic stress and its implications for health service design and delivery.”</td>
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</tbody>
</table>
| 9.30 a.m. | **O1** Targeting the BMP signalling pathway as a novel therapeutic approach in Parkinson's disease  
|           |  *Ms Susan Goulding, et al*, Dept of Anatomy and Neuroscience, UCC |
|           | **O2** Investigating the role of mitochondrial dysfunction in gestational diabetes mellitus and elucidating if Body Mass Index is a causative mediator  
|           |  *Mr Colm McElwain et al*, Dept of Pharmacology and Therapeutics, UCC |
|           | **O3** The Effect of Fingolimod on Regulatory T Cells in a Mouse Model of Brain Ischaemia  
|           |  *Mr Kyle Malone, et al*, School of Pharmacy, UCC |
| 10.00 a.m.| **O4** Neurovascular coupling remains intact following acute exposure to high altitude (3800m)  
|           |  *Mr Jack Leacy, et al*, Dept of Physiology, UCC |
| 10.30 a.m.| **O5** Role of NADPH oxidase in chronic intermittent hypoxia-induced diaphragm dysfunction: Insights from pharmacological and transgenic approaches  
|           |  *Ms Sarah Drummond, et al*, Dept of Physiology, UCC |
|           | **O6** Investigating the association between long non-coding RNAs and ductal carcinoma in situ (DCIS)  
|           |  *Miss Julia Samson, et al*, School of Biochemistry, UCC |
| 11.00 a.m.| COFFEE and Viewing of Posters                                         |
## Session 2

*Chairs: Professor Mary Cahill and Dr Colm O Tuathaigh*

### 11.25 a.m.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter(s)</th>
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<tr>
<td>O7</td>
<td>Dr Desmond Murphy, Consultant Respiratory Physician</td>
<td>A five-year retrospective review of fatalities involving novel psychoactive substances in Southern Ireland&lt;br&gt;<em>Mr Andrew Mazuerk et al, School of Medicine, UCC</em></td>
</tr>
<tr>
<td>O8</td>
<td>O7</td>
<td>Improving the Quality of Dementia Care in General Practice: A Qualitative Study&lt;br&gt;<em>Miss Meghan Bourque et al, School of Medicine, UCC</em></td>
</tr>
<tr>
<td>O9</td>
<td>O7</td>
<td>An evaluation of stress levels in carers of children with autism spectrum disorder&lt;br&gt;<em>Ms Aisling Holland et al, Dept of Paediatrics, UCC</em></td>
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### 11.55 a.m.

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### 12.30 p.m.

LUNCH and viewing of posters. Poster judging.
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| 1.45 p.m. | Dr. Jane English, Anatomy and Neuroscience and INFANT Centre UCC  
**Working Title** “Multi-omics profiling for biomarker discovery in maternal and child health” |
| 2.15 p.m. | Mr Pat Casey, BioSafety Advisor, Biological Safety Advisory Group  
**Working Title** “BioRAFT: biosafety compliance simplified”  
*With support from the SFI Infrastructure Fund, UCC will be the first European university to implement BioRAFT, an online tool designed to reduce time spent by researchers on compliance to biosafety legislation. This talk will give a brief overview of the system and how it can simplify biological safety in your laboratory.* |
| 2.20 p.m. | O14 Predicting Type 2 Diabetes Development Among Patients in General Practice; A Prospective Analysis Comparing Novel Biomarkers  
*Dr Michael Hanrahan et al, School of Public Health, UCC* |
| 2.40 p.m. | O15 Prevalence of Undiagnosed Obstructive Sleep Apnea in an Elective Surgical Patient Population  
*Miss Cathriona Murphy et al, School of Medicine, UCC* |
| 2.50 p.m. | Atlantic Corridor Undergraduate Medical Conference winners  
Characteristics and Assessment of Potential Concussive Events in Gaelic Athletic Association Players  
*Mr Mario Rotundo & Mr Darek Sokol-Randell, School of Medicine, UCC* |
| 3.20 p.m. | Prize giving and meeting close |
**Guest Speaker Profiles**

**Dr Sharon Lambert**

Dr Sharon Lambert joined the teaching staff in the School of Applied Psychology in 2014 following a number of years working within community-based settings that provide supports to marginalised groups. Sharon’s research interests revolve primarily around the impact of trauma on development, its link with substance misuse and mental health and consequent considerations for service design and delivery. Sharon conducts research with community-based partners such as addiction, homelessness, criminal justice and educational organisations. The research looks at both primary psychological trauma (ACEs) and secondary traumatic stress. The impact of trauma on wellbeing and outcomes is explored and the application of research and theory to service delivery is of significant interest.

Sharon regularly delivers training to professionals working in front line services. Sharon also presents at psychology conferences and has delivered training seminars to the Metropolitan Police in the U.K. and to the National Bureau of Criminal Investigation in Ireland. Sharon has also acted as a special advisor to Garda Working Groups and the EU and is currently involved in research with the National Ambulance Service.

**Dr Cian McCafferty**

Dr. Cian McCafferty is interested in how neurons cooperate and integrate to determine our behaviour and experience, with particular focuses on oscillatory rhythms of the brain and the interactions between the gut microbiome and the nervous system. After graduating from UCC with a B.Sc. in Neuroscience, he pursued a Ph.D. in experimental electrophysiology of epilepsy in Cardiff University, looking at the activity and pharmacology of individual neurons in a rat model of absence seizures. Subsequently, he undertook a postdoctoral fellowship at Yale University into the neuronal and network determinants of the severity of absence seizures. His current research at UCC and APC Microbiome Ireland focuses on the patterns of neuronal and network activity that mediate the microbiome’s effects on anxiety, mood and cognition-related behaviours.
Dr Desmond Murphy

Dr Murphy is a Consultant in Respiratory Medicine in CUH. He completed undergraduate degrees in Chemistry (TCD) and medicine (RCSI). He graduated from the Irish SPR program in Respiratory Medicine. Following the award of ERS fellowship Dr Murphy worked at the Freeman Hospital in lung transplantation. His research led to the award of PhD from Newcastle University. Subsequently, he was a post-doctoral fellow at McMaster University where his interests were focused on asthma. He is a member of the Irish SPR Training Committee, the CREC of the UCC affiliated hospital group, the ITS expert committee/Clinical advisory group to HSE/joint regional lead for Asthma, the ITS expert committee/Clinical advisory group to HSE/joint regional lead for COPD and the scientific committee of the Asthma Society of Ireland. He heads a research programme in CUH/UCC. He has been Principal and Chief Investigator on several trials. He has authored or co-authored over 70 publications in peer-reviewed journals, 3 book chapters, and over 200 abstracts. He is co-PI on a HRB grant examining compliance in asthma and has active funding from APC, UCC, Wilton Respiratory Research Fund and Irish Lung Foundation. His research examines factors associated with adverse outcomes and severe clinical phenotype in airways diseases.

Dr Jane English

Dr Jane English is a lecturer in the Department of Anatomy & Neuroscience, University College Cork (UCC), a HRB Principle Investigator and Head of Mass Spectrometry at INFANT, UCC. Jane graduated with a BSc in Biotechnology from NUI Maynooth, and MSc in Human Molecular Genetics from Imperial College London. Jane conducted her PhD research in Proteomics and Molecular Psychiatry in the Department of Psychiatry, Royal College of Surgeons in Ireland (RCSI), followed by postdoctoral research in Neuroproteomics in the Conway Institute of Bimolecular and Biomedical Research, University College Dublin, and in RCSI. In 2017, Jane relocated to Cork to take up a Science Foundation Ireland - Industry Fellowship with a view to gaining industry experience in personalised diagnostics and the development of commercial biomarker assays for preeclampsia at Metabolomics Diagnostics Ltd., Little Island, Cork. In 2017, Jane was also awarded a prestigious Emerging Investigator Award from the Health Research Board to pursue blood-based biomarkers of Autism Spectrum Disorder (ASD) at INFANT, UCC. This large-scale international collaborative study is focused on the early identification of infants with severe childhood ASD to facilitate early intervention and improve clinical outcome. In 2018, Jane was appointed lecturer in the Department of Anatomy & Neuroscience.
Jane’s research broadly focuses on the application of Multi-Omics techniques, Bioinformatics, and Machine Learning approaches to study the molecular pathways implicated in human health and disease, with a focus on maternal and child health.

Prof Denis O’Mahony

Professor Denis O’Mahony is associate professor and consultant physician in the Department of Medicine at University College Cork, Ireland. His special interest is pharmacotherapy in older people, specifically inappropriate prescribing in late life and its consequences. He invented the widely used STOPP/START criteria for inappropriate prescribing. He has recently co-ordinated the EU FP7-funded SENATOR project and is a co-principal investigator in the EU Horizon 2020 OPERAM project; both projects have examined the effect of software-delivered STOPP/START criteria on adverse clinical outcomes for older people in hospital. To date, he has over 180 peer-reviewed publications, mostly on pharmacotherapy in late life.
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Oral Abstracts

O01

Targeting the BMP signalling pathway as a novel therapeutic approach in Parkinson's disease

SR Goulding\textsuperscript{1,2}, AM Sullivan\textsuperscript{2}, GW O'Keeffe\textsuperscript{2}, LM Collins\textsuperscript{2,3}

\textsuperscript{1}Department of Biological Sciences, Cork Institute of Technology, Cork, Ireland
\textsuperscript{2}Department of Anatomy & Neuroscience, University College Cork, Cork, Ireland
\textsuperscript{3}Department of Physiology, University College Cork, Cork, Ireland

Parkinson’s disease is a neurological disorder affecting over 10 million people worldwide. The disease is characterised by the progressive loss of dopaminergic neurons from the substantia nigra and the accumulation of α-synuclein known as Lewy bodies or Lewy neurites, which are thought to induce dopaminergic degeneration. Currently, the available treatment options are solely symptomatic and do not slow or stop disease progression. This highlights the need to identify factors that are neuroprotective or neuroregenerative against the progressive dopaminergic degeneration. We have recently identified a member of the Bone Morphogenetic Protein family, known as BMP2, whose expression is significantly correlated with that of several key markers of dopaminergic neurons in the human substantia nigra. Additionally, we found BMP2 expression to be downregulated in Parkinson's disease. Moreover, treatment with BMP2 was neuroprotective against dopaminergic degeneration in \textit{in vitro} models of Parkinson’s disease. Specifically, BMP2 protected against degeneration induced by the neurotoxins, MPP\textsuperscript{+} and 6-OHDA, and degeneration induced by overexpression of wild-type α-synuclein and mutant A53T-α-synuclein in primary cultures of the E14 rat ventral mesencephalon. Moreover, two FDA-approved drugs, Quinacrine and Niclosamide, modulate the BMP2 signalling pathway in a BMP2 reporter cell line. In addition, we found these two drugs were neuroprotective in \textit{in vitro} models of Parkinson’s disease. Collectively, these data show the neuroprotective potential of BMP2 and identifies two drugs, that are safe for use in patients, that can mimic the effects of endogenous BMP2. This highlights the feasibility of targeting the BMP signalling pathway in patients with Parkinson’s disease.
Investigating the role of mitochondrial dysfunction in gestational diabetes mellitus and elucidating if Body Mass Index is a causative mediator

C. McElwain, C. McCarthy

Department of Pharmacology and Therapeutics, University College Cork, Cork, Ireland

Introduction: Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance which is diagnosed during pregnancy and poses considerable health risks for mother and child. Maternal Body Mass Index (BMI) correlates with GDM diagnosis and the pathophysiology of this link may be explained through a sequence of pro-inflammatory signalling and mitochondrial dysfunction.

Objective: Investigate if mitochondrial dysfunction is evident in GDM by measuring mitochondrial DNA concentration and elucidate if a potential relationship exists between maternal mitochondrial function and GDM diagnosis.

Methods: Plasma samples were taken at 20 weeks’ gestation from women who subsequently developed GDM (n=44) and control healthy pregnant women (n=85). Control group 1 was matched by maternal age and BMI (n=41), while control group 2 was matched by maternal age alone (n=44). Prediction potential was determined by multinomial regression analysis. Statistical analysis was performed on SPSS Statistics v25.

Results: Wilcoxon signed-rank test showed a significant difference in maternal mtDNA concentration when the GDM cases were compared with control group 2 (p = 0.03). Multinomial regression analysis showed a statistically significant association between mtDNA concentration and GDM diagnosis (B = 0.001, p = 0.019, OR = 1.001) in GDM cases versus control group 2 indicating that GDM patients have higher circulating mtDNA concentrations relative to healthy control patients. The lack of statistical significance in control group 1 suggests that BMI may be linked to mitochondrial function in GDM patients.

Conclusion: These results demonstrate a potential pathogenic role for mitochondrial dysfunction in GDM, with BMI presenting as a likely physiological mediator.
The Effect of Fingolimod on Regulatory T Cells in a Mouse Model of Brain Ischaemia

K Malone¹, AC Moore², C Waeber¹

¹Pharmacology & Therapeutics, School of Pharmacy, University College Cork, Cork, Ireland
²School of Biochemistry and Cell Biology, University College Cork, Cork, Ireland

Introduction: Fingolimod (FTY720) has emerged as a candidate therapy in stroke. However, while FTY720 seems beneficial in rodent stroke models, its mechanism of action remains disputed. The aim of this study was to test the hypothesis that FTY720-mediated increases in the number and function of regulatory T cells (Treg) (a lymphocyte population known to promote stroke recovery) may underlie its protective effect in experimental brain ischaemia, in both normal mice and in mice with common stroke comorbidities.

Methods: Young mice (8-10 weeks), aged mice (72-73 weeks), and ApoE⁻/⁻ mice fed a high fat diet (20-21 weeks) (all C57BL/6, male) underwent permanent middle cerebral artery occlusion. Mice received either saline or FTY720 (0.5mg/kg or 1 mg/kg) at 2, 24, and 48 hours post-ischaemia. At 7 days post-ischaemia, flow cytometry was used to quantify Tregs in blood, spleen, and lymph nodes.

Results: FTY720 dose-dependently increased Treg frequency in the spleens of young mice (p < 0.0001). FTY720 (0.5 mg/kg) also increased Tregs in the spleens of aged (p = 0.0348) and ApoE⁻/⁻ (p = 0.0002) mice. The highest Treg frequency in FTY720-treated mice was reported in ApoE⁻/⁻ mice both in spleen (9.32±1.73% in ApoE⁻/⁻ mice, 7.8±3.01% in young mice and 6.09±1.64% in aged mice), and in blood (8.39±3.26% in ApoE⁻/⁻ mice, 5.43±2.74% in young mice and 4.56±1.60% in aged mice).

Conclusions: FTY720 increased Treg frequency in spleen and blood post-ischaemia, possibly contributing to its neuroprotective activity. The most pronounced effects were seen in a model of hypercholesteremia, a major stroke co-morbidity.
Neurovascular coupling remains intact following acute exposure to high altitude (3800m)

JK Leacy¹, D Burns¹, N Jendzjowsky³, C Braun³, B Herrington³, R Wilson³, T Vermeulen⁴, G Foster⁴, AJ Rosenberg⁵, C Rickards⁵, KD O'Halloran¹, TA Day²

¹Department of Physiology, University College Cork, Cork, Ireland
²Department of Biology, Mount Royal University, Calgary, Canada
³Hotchkiss Brain institute, University of Calgary, Calgary, Canada
⁴School of Health and exercise sciences, University of British Columbia Okanagan, Kelowna, Canada
⁵University of North Texas health science centre, University of North Texas, Denton, USA

Neurovascular coupling (NVC) is the temporal and spatial co-ordination of local neuronal activity and regional cerebral blood flow. NVC is essential for the deliverance of nutrients to cerebral tissue in instances of heightened metabolic demand. Exposure to high-altitude (HA) elicits profound physiological stressors such as blood gas and acid base disturbance. The aim of this project was to determine whether acute blood gas and acid-base disturbance would impair cerebrovascular function, evidenced by NVC response magnitude. 14 healthy volunteers ascended to Barcroft high-altitude research station (3800m; California, US). Cerebral blood velocity and NVC response were measured using a transcranial Doppler ultrasound. NVC was measured through the posterior cerebral artery (PCA) and indexed as the mean and peak change in velocity in response to visual stimulation (VS). NVC response magnitude was averaged across five separate VS trials. Arterial blood draws were taken to assess arterial blood gas and acid-base disturbance as well as determine acclimatisation status of participants. Measures were taken at Calgary (baseline; 1045m) and on days two and nine at HA (3800m). Preliminary results from this study demonstrate 1) The hypoxic environment of HA elicits profound reductions in both PaO₂ and SaO₂, 2) The ventilatory response to hypoxia elicited hypocapnia, evidenced by significant reductions in PaCO₂, 3) Arterial pH was maintained following increased renal excretion of arterial bicarbonate, 4) NVC response magnitude was unaffected by acute exposure to HA. Interpretation of preliminary findings are 1) Cerebrovascular function remains intact following acute exposure to HA, 2) NVC could be unique function of arterial pH maintenance.
Role of NADPH oxidase in chronic intermittent hypoxia-induced diaphragm dysfunction: Insights from pharmacological and transgenic approaches

S.E Drummond, D.P Burns, O Ziegler, S El Maghrani , V Healy, K.D O'Halloran

Department of Physiology, University College Cork, Cork, Ireland

Obstructive sleep apnoea syndrome (OSAS) is characterized by exposure to chronic intermittent hypoxia (CIH). CIH evokes redox changes culminating in impaired diaphragm muscle function. We sought to investigate the putative role of the superoxide-generating NADPH-oxidase 2 (NOX2) enzyme in CIH-induced diaphragm muscle dysfunction.

A mouse model of CIH was generated by the cycling of gas from normoxia (21% O2) for 210s to hypoxia (5% O2 at the nadir) over 90s for 8hr/day during light hours for 2 weeks. Adult male (C57BL/6J) mice were assigned to one of 5 groups: normoxic controls, CIH-exposed, CIH+apocynin (NOX2 inhibitor, 2mM) administered in the drinking water throughout the CIH exposure, and NOX2 null (B6.129S-Cybb<sup>tm1Din/J</sup>) mice assigned to a sham or CIH exposure. On day 15, diaphragm muscle contractile function was examined ex vivo. Gene expression was examined by qRT-PCR.

Exposure to CIH significantly decreased diaphragm muscle peak specific force by ~45% compared with sham exposure. Administration of apocynin and NOX2 gene knockout completely prevented CIH-induced diaphragm muscle weakness. CIH increased the mRNA expression of NRF2, MuRF1, BNIP3, LC3B, GABARAPL1, PARK2, Myostatin, Myogenin, MEF2C, MyoD. Apocynin and NOX2 gene knockout entirely prevented these CIH-induced increases.

Mice show signs of profound diaphragm muscle dysfunction and increased mRNA expression of genes relating to muscle antioxidant defence, atrophy, autophagy, mitophagy and regeneration following 2 weeks of CIH. Studies in NOX2 null mice reveal that NOX2 is necessary for CIH-induced diaphragm muscle weakness. Our results have implications for human OSAS and point to antioxidant intervention as a potential therapeutic strategy.
Investigating the association between long non-coding RNAs and ductal carcinoma in situ (DCIS)

J Samson¹, S Das², D O'Connor², A O'Shea³, M B Casey³, T Hayes³, L O'Callaghan³, X Miro⁴, D Rose⁴, K Dean¹

¹School of Biochemistry and Cell Biology, UCC, Cork, Ireland
²Department of Molecular and Cellular Therapeutics, RCSI, Dublin, Ireland
³Bon Secours Hospital and School of Medicine, UCC, Cork, Ireland
⁴Roche Diagnostics, Roche, Mannheim, Germany

Breast cancer is the most common cancer in women globally, with incidence rates increasing and survival rates varying widely depending on early detection and access to treatment. In Ireland, the number of diagnoses is increasing, 89% of new cases being invasive breast cancer. To reduce that number, there is an urgent need for specific and sensitive diagnostic biomarkers for the earliest stages of breast cancer.

Ductal carcinoma in situ (DCIS) is a non-obligate precursor to invasive ductal carcinoma. With an increasing number of studies linking long, non-coding RNAs (lncRNAs) to various cancers, we have specifically selected to examine lncRNAs as novel DCIS biomarkers and to characterise their biological roles. We have performed lncRNA-capture RNA sequencing (RNAseq) on two patient-derived DCIS cell lines (ETCC-006 and ETCC-010) and one cellular model of DCIS, MCF10DCIS.com. From those, we identified 92 differentially expressed lncRNAs. Using data from The Cancer Genome Atlas, we reduced our targets to six lncRNAs whose altered expression is associated with adverse breast cancer patient outcomes. Next, we aimed to functionally characterize those targets by monitoring proliferation and migration after altering their expression levels. This led us to focus specifically on LOC729970, an uncharacterized lncRNA. To investigate its molecular function, we identified LOC729970, specific proteins interactors. Future work will focus on characterising the RNA-protein interactions and their biological roles.

Ultimately, our goal is to identify and characterise lncRNA biomarkers in DCIS, leading to the development of diagnostic tools that could change how early breast cancer is detected and treated in patients worldwide.
A five-year retrospective review of fatalities involving novel psychoactive substances in Southern Ireland

A Mazurek¹, M Bolster²

¹School of Medicine, University College Cork, Cork, Ireland
²Department of Pathology, University College Cork, Cork, Ireland

Background: Novel Psychoactive Substances (NPS) are emerging and being reformulated at increasingly rapid rates, creating unpredictability in drug markets and ineffective drug policies. The National Advisory Committee on Drugs has recommended surveillance of local trends in NPS use given that Ireland has the highest self-reported use in Europe and there is a lack of literature on the health risks of these substances.

Aim: To elucidate the demographic and autopsy findings of fatalities involving consumption of NPS in Southern Ireland as compared to other illicit drugs of abuse (DOA).

Method: Postmortem reports completed by the Assistant State Pathologist between 2012 and 2016 with positive toxicology for illicit DOA were identified, and descriptive analysis was undertaken to compare toxicological findings, pathology, and circumstances surrounding death.

Results: 164 cases with positive toxicology for illicit substances were identified, of which 17 (10.4%) involved NPS. Where detected, NPS contributed to the cause of death in 64.7% of cases. Polydrug use accounted for the majority (72.7%) of acute intoxications, and fatal users were predominantly male (90.9%) and young (mean 29.5 years). Most deaths occurred in a home environment, but cases of NPS overdose were more likely to reach hospital than with other DOA. Autopsy findings were minimal but commonly featured pulmonary congestion, aspiration of foreign material, and cerebral oedema.

Conclusion: NPS are involved in a small fraction of autopsy cases, but contribute significantly to acute intoxication fatalities. Knowledge of common autopsy findings and associated demographics can reinforce the need for toxicological analysis when autopsy fails to find significant natural disease or trauma.
Improving the Quality of Dementia Care in General Practice: A Qualitative Study

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Background: The prevalence of dementia in Ireland is rising. General Practitioners (GPs) play a central role in caring for people with dementia. There is a growing demand for community-based care, emphasized by the Irish National Dementia Strategy (INDS). However, there is a paucity of research exploring GPs’ views on dementia care since publication of the INDS. The aim of the study is to develop a deeper understanding of how to improve the quality of dementia care in General Practice from the perspective of Irish GPs.

Methods: Semi-structured interviews were conducted with GPs. GPs who completed the ‘Dementia in Primary Care’ CPD module at UCC were purposively recruited. Interviews were audio-recorded, transcribed, and analyzed by thematic analysis.

Results: 12 (34.3%) GPs agreed to participate. 10 interviews have been conducted to-date. Interview findings fell into three major categories: facilitating factors; barriers to care; and recommendations to enhance care. Quality care was facilitated by continuity of care, early disease recognition, coding, audit, and coordinated care teams. Time, funding, access to secondary care, and inadequate community resources hindered care. GPs emphasized the need for coordinated community services, GP education, review of the chronic disease management scheme for GPs, and service standardization to improve care.

Conclusion: GPs find dementia care to be a complex and challenging aspect of primary care. While education and training is advocated by GPs, service delivery also needs to be reconfigured. Dementia needs to be included under chronic disease management in Ireland and services must become standardized.
An evaluation of stress levels in carers of children with autism spectrum disorder

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Autism Spectrum Disorder (ASD) is an umbrella term for a range of neurodevelopmental disabilities that affect social interaction and communication skills. Previous studies have demonstrated the physical, psychological and financial strain that full time care of a child with ASD, can put on a family, but no such studies have been done in Ireland. Currently, ASD services are limited and there are no external respite facilities for those under 18 years. It is important that we record and evaluate the growing stress of these carers, to highlight this issue and the need to establish support services.

Objectives:

1. To evaluate stress levels of parents/carers of children with ASD.
2. To highlight how stress levels effect positive and negative outlooks
3. To establish evidence to support the need for services and practical guidelines to improve the health and wellbeing of care providers to children diagnosed with ASD.

Methods: An online survey using Parental Stress Scale (PSS) was advertised on ASD support group websites across Ireland. Over 300 participants answered the survey, n=289 were analysed.

Inclusion: parents/guardians/full-time care providers to children <18 years, with a previous diagnosis of ASD. Exclusion: child was not <18, no previous diagnosis or if they did not complete the full survey.

Results: Average stress; PSS: 63.5/100 (Std=8.5) Self-rated: 7.9/10 (Std=1.5). Strongest positive correlation for stress; worry and being overwhelmed (p<0.01). Strong negative correlations; good support and closeness to the child (p<0.05). Linear regression: Good support, financial situation and positive outlook showed to be protective against stress levels (B=-0.3;0.5; -0.4; -0.24, P<0.01). Worry and poor mental health increased stress levels (B=-0.662; 0.947, p<0.01).

Conclusion: This survey demonstrates that careproviders experience high stress levels. It highlights the impact of positive and negative factors on stress levels. It demonstrates the need for evaluation of these stress levels including qualitative studies, in order to create support services to help cope with this stress and improve overall health of these care providers and better future care for children with ASD.
Predictors of attendance at Diabetic Retinopathy Screening: Secondary analysis of data from a structured diabetes care programme

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Aims
To estimate the rate of attendance at diabetic retinopathy screening (DRS) amongst adults with type 2 diabetes and to look at predictors of attendance, both overall and at specific screening services.

Methods
Data were extracted from the 2016 audit of the Midlands Diabetes Structured Care Programme (N=1106). Logistic regression was preformed to examine predictors associated with two outcomes of interest; 1) Attendance at any screening and 2) Type of screening attended. Screening types examined were 1) RetinaScreen and 2) specialist ophthalmology services.

Results
Overall, 78% of patients reported attendance at DRS in the past 12 months. Factors associated with attendance included diabetes control (Ref: Diet-controlled, Tablet-controlled: OR=2.05; 95%CI=1.35-3.12, Insulin-controlled: OR=1.94; 95%CI=1.09-3.54) and attendance at a diabetes nurse specialist (DNS) in the past 12 months (OR=2.27; 95%CI=1.28-4.03). A blood glucose level which was not on target was associated with decreased attendance (OR=0.68; 95%CI=0.48-0.98). More specifically, 45% of participants attended at RetinaScreen only and 23% attended at specialist ophthalmologist services only. Factors associated with attendance at RetinaScreen only included diabetes control (Ref: Diet-controlled, Tablet-controlled diabetes: OR=1.85; 95%CI=1.14-3.00, insulin-controlled diabetes: OR=1.35; 95%CI=0.70-2.60) and attendance at DNS within the last 12 months (OR= 2.06; 95%CI=1.23-3.43). Female sex (OR=0.66; 95%CI=0.47-0.92) and younger age (OR=0.98; 95%CI=0.96-0.99) were associated with decreased attendance at RetinaScreen.

Conclusions
Attendance at the national screening service, RetinaScreen is suboptimal. Future planning of DRS services and referrals should consider potential predictors reported in this study (sex, age, diabetes control method, blood glucose control and DNS attendance) to potentially increase attendance.
O11

What Does Your Pelvic Floor Do For You: Knowledge Of The Pelvic Floor In Female University Students

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Background: Pelvic floor dysfunction (PFD) is a known healthcare and economic burden. Pelvic floor muscle exercises (PFMEs) can both prevent and treat PFD. Low levels of knowledge of the pelvic floor have been associated with higher levels of PFD. Assessing the current level of knowledge in young women will inform healthcare strategies for effective management and prevention of pelvic floor dysfunction.

Aim: To assess the knowledge of the pelvic floor in female university students, including knowledge of pelvic floor structure and function, PFD and PFMEs.

Methods: An online questionnaire was distributed to students at their registered email address. Knowledge was assessed through 15 questions, allocating a score of 1 to each correct question.

Results: 938 responses were received. 72.9% (n=663) of students had never received information on the pelvic floor. 66% of respondents (n=564) said they understood what was meant by PFMEs, however 72.5% (n=621) incorrectly identified how to perform PFMEs. Of the 43.1% (n=225) who reported exercising their pelvic floor, 61% (n=225) incorrectly identified how to perform PFMEs. There was statistically significant difference (p<0.001) in the overall knowledge between students in the School of Medicine and Health (n=307, Mean=11.8, SD=2.35) and Other Schools (n=529, Mean=9.39, SD 2.88).

Conclusions: Further studies are required to improve knowledge of the pelvic floor and encourage PFMEs in young women. Low levels of knowledge of the pelvic floor levels are associated with a high prevalence of PFD. By increasing awareness of the pelvic floor and PFMEs, we can reduce symptoms of PFD and thus improve quality of life.
The Prevalence of Pre-Diabetes in Middle-to Older-Aged Irish Adults and Associated Determinants

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Type 2 diabetes is a leading cause of death and disability worldwide. Pre-diabetes is a strong predictor of diabetes progression. Studies estimating the prevalence of pre-diabetes in Irish populations are sparse and conflicting. This research examined the prevalence and determinants of pre-diabetes in a nationally representative sample of middle-to older-aged Irish adults using three diagnostic methods.

Participants were recruited from a random sample of Caucasian-European primary care centre attendees (Mitchelstown Cohort Rescreen, 2016-2017). Those who provided blood samples (n= 1,378) were included in this study. Pre-diabetes was defined using: American Diabetes Association (ADA) HbA1c cut-offs: 5.7%–6.4%, World Health Organization International Expert Committee (WHO-IEC) HbA1c cut-offs: 6.1%–6.4% and ADA fasting plasma glucose (FPG) cut-offs: 5.6–6.9 mmol/l. Univariate and multivariable logistic regression analyses determined relationships between factors and pre-diabetes.

The prevalence of pre-diabetes was 43.9% (95% CI: 41.2-45.5%), 14.5% (95% CI: 12.7%-16.5%) and 15.8% (95% CI: 13.9%-17.8%) according to ADA HbA1c, WHO-IEC HbA1c and ADA FPG definitions respectively. Factors associated with pre-diabetes in univariate analyses included sex, age, marital status, health rating, education, and diet. In multivariable analysis, subjects classified by ADA FPG criterion displayed the least optimal metabolic profile defined by overweight/obesity (OR=2.88, 95% CI: 1.53–5.43), hypertension (OR=2.27, 95% CI: 1.15–3.40) and low high-density lipoprotein cholesterol concentrations (OR=1.75, 95% CI: 1.07–2.87).

The discordance between prevalence according to method of diagnosis is concerning. A national Diabetes Prevention Programme is currently being developed in Ireland and effectiveness may be assessed by monitoring pre-diabetes prevalence. This study may help inform a decision regarding pre-diabetes definition.
Predicting Type 2 Diabetes Development Among Patients in General Practice – A Prospective Analysis Comparing Novel Biomarkers

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Background: Type 2 diabetes is a significant public health issue worldwide. There is increasing interest in novel methods to identify individuals who are at risk to allow earlier targeted interventions. The aim of this study was to evaluate a range of pro-inflammatory cytokines, adipocytokines, acute-phase response proteins, coagulation factors, white blood cells and lipid particle sizes in their ability to predict incident diabetes cases.

Methods: A selection of 22 inflammatory markers, white blood cells and lipid particles were measured in a random sample of 1,754 men and women aged 46–73 years. A weighted biomarker risk score was developed based on the strength of associations of individual biomarkers with 6-year type 2 diabetes development. Discriminatory ability was assessed using receiver operating characteristic curve analysis.

Results: A risk score which included monocytes, large very low-density lipoprotein and small low-density lipoprotein biomarkers had an area under the curve (AUC) of 0.76 which increased to 0.91 when added to fasting glucose, a difference that was statistically significant compared to glucose alone (AUC=0.88, p=0.01). At fixed sensitivities of 95%, 85%, 75% and 70%, the false positive rates for a model which included the biomarker risk score with glucose were 36%, 26%, 11% and 8% respectively. The corresponding false positive rates for a model with glucose alone were 43%, 36%, 17% and 13%.

Conclusion: These data highlight the potential role for novel biomarkers in enhancing current prediction models for type 2 diabetes and may provide further insight into the pathogenesis of the condition. Further research on diabetes-related biomarkers is warranted.
Prevalence of Undiagnosed Obstructive Sleep Apnea in an Elective Surgical Patient Population

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Introduction: Obstructive Sleep Apnea (OSA) is a common sleep disorder. There is a paucity of data in Ireland regarding the prevalence of the condition. It commonly remains undiagnosed in surgical populations and this results in an increased risk of peri-operative adverse events. Peri-operative screening for OSA would allow for anaesthetic modifications to be made to reduce these risks and improve patient outcome.

Methods: Patients over eighteen years attending the SIVUH undergoing elective surgical procedures were included in the study. Exclusion criteria included patients with a history of substance abuse (excluding tobacco), pregnant females and those undergoing cranial neurological procedures. Participant consent was obtained and the STOP-BANG Questionnaire was distributed to willing participants. BMI and neck circumference were noted. The demographic profile, anthropometric measurements and the presence or absence of OSA was noted.

Results: This study included 200 patients. There was a slight female predominance. Using the STOP-BANG Questionnaire, 24% of patients were found to be high-risk for OSA, with a male predominance. The high-risk group had a higher prevalence of hypertension and coronary artery disease. Similarly, a higher prevalence of respiratory problems, including asthma and COPD, were found in the high-risk group. The proportion of subjects high-risk for OSA with endocrine pathologies was not found to be significantly different from the low-risk group.

Conclusion: A significant proportion of people attending an Irish university hospital were high-risk for OSA. A high index of suspicion in combination with a screening tool should improve detection of these patients and allow for appropriate adjustments to anaesthesia care to be made.
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Poster abstracts

P001

Five Year Follow Up of Ceramic-on-Ceramic Total Hip Replacement in Cork, Ireland

DM Gillette¹, R Gul²,³

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We conducted a prospective study of ceramic-on-ceramic total hip arthroplasties (THA) in Cork, Ireland to determine the 5-year functional outcomes and evaluate mid-term survivorship. Between January 2011 and December 2012, 96 patients (99 hips) underwent THA via an anterior (48 hips; 57.83%) or posterior approach (35 hips; 42.17%). Patients who received ceramic-on-ceramic implants were included. At each follow-up, clinical outcomes of WOMAC and SF-12 functional scores were recorded and a paired t-test was used to compare pre- and post-operative scores. A Kaplan-Meier analysis was undertaken to estimate survival. 16 hips were removed from analysis due to exclusion criteria. 83 hips (46 men, 37 women) were followed for a mean of 32.57 months (0-60). The mean age at surgery was 49.7 years (27-60). The mean pre-operative WOMAC score of 36.18 improved to 86.8 (p <0.0001), while the SF-12 score of 29.77 improved to 30.91 (p = 0.0013), at final follow-up. The five-year survivorship without re-operation was 96.4% (3/83 were revised). These findings demonstrate that surgery significantly improved functional scores and that rates of surgical revision of THA in Cork are low. This is comparable to rates found in Australia, who benefit from a national joint registry which provides evidence-based guidelines. It is shown that the current practice in Cork is aligned with best practice in Australia. It is therefore suggested that once Ireland’s national joint registry begins to output data analysis, the wealth of information could be used to influence guidelines and allow for future research to compare outcomes in a global setting.
Development of an Internal Quality Review Process for Essential Study Documents

M Spillane, RE Keane, N Kelly, M Kelsey

HRB-Clinical Research Facility Cork, University College Cork, Cork, Ireland

Background: Maintaining study documentation and source documents is an area that can be easily postponed, and is one of the most common findings from GCP inspections.¹ The Clinical Research Facility Cork (CRF-C) has recently developed a system of conducting Internal Quality Reviews of research studies run by its Operations team.

Objectives: To maintain the high quality standards of research carried out by the CRF-C; to minimise findings from monitoring visits and audits; and to ensure that studies are inspection-ready at all times.

Methods: The Clinical Management Team and Quality & Regulatory Affairs Director decide and prioritise which studies will be reviewed once per quarter. A member of the Quality team reviews the Investigator Site File (ISF) and a percentage of the Source Documents for the selected studies.

Results: Between September 2018 and April 2019, 21 reviews were completed on 18 studies. The main findings with the ISF were: updated or relevant CV’s/GCP certificates not filed (20%); relevant Ethics and Regulatory approvals not filed (15%); and incorrectly completed Delegation Logs (14%). Findings with the Source Documents included: insufficient or no documentation of AE’s/SAE’s (30%); poor documentation of study visits and consent process (22%); and de-identification of source documents (15%).

Conclusions: Study staff have reported favourably on the reviews and are now more aware of the importance of maintaining study documentation throughout the life-cycle of a study. The process has raised the quality of research study documentation at the CRF-C.

¹ ‘Overview of GCP inspections including common findings’, presented at HPRA Information Day, Dublin, 23rd October 2018
https://www.eiseverywhere.com/ehome/345191
The Effect of Haemodialysis on Visual Acuity and Retinal Structure in Patients with End-Stage Renal Disease

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Introduction: Many patients with end-stage renal disease (ESRD) may have ocular pathologies manifesting as low visual acuity. Treatment with haemodialysis (HD) removes excess extracellular fluid and filter serum metabolites. Few studies have investigated this potential effect on ocular parameters.

Aim: To investigate the effects of HD on best corrected visual acuity (BCVA), macular thickness (MT), and average retinal thickness (ART) in patients with ESRD.

Methods: In this prospective case series, the right eye of 9 patients receiving HD underwent ocular examinations using a Snellen chart and optical coherence tomography (OCT). Snellen chart values were converted to logMAR values. Patients were examined before commencing their first HD session (pre-HD), then a week, a month, and 3 months subsequently. Statistical software (SPSS v.24) was used for statistical analyses.

Results: In comparison to baseline values at pre-HD, changes occurred in BCVA, MT, and ART in the first week, first month, and third month from the start of HD. However, these changes failed to achieve statistical significance (P-value >0.05). The most notable change in MT occurred in a patient presenting with macular edema, where there was a reduction in thickness of 28um and 25um in the first month and third month, respectively. This was also accompanied by an improvement in BCVA.

Conclusions: Although no statistically significant changes were reported, this study found a trend towards improvement of BCVA following HD. Moreover, a reduction in MT was noted where there was documented increased MT pre-HD. Further investigations involving a larger sample size is required to confirm these preliminary findings.
An exploration of women’s experience of being involved in research during pregnancy

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²Cork University Maternity Hospital, CUMH, Cork, Ireland
³National Perinatal Epidemiology Centre, NPEC, Cork, Ireland

Background: Pregnant women are seldomly included in randomised controlled trials (RCTs) and their attitudes and experiences of this are rarely investigated. Gathering feedback of their experience is paramount for future trial design to facilitate participation.

Methods: A qualitative study was undertaken to examine the barriers, facilitators and motivators related to participation in research during pregnancy. This was a nested study within the PARROT Ireland RCT at a single recruiting site. PARROT Ireland is an ongoing, national, multi-site RCT of a diagnostic test for pre-eclampsia; Placental Growth Factor. In-depth semi-structured interviews with 19 women who had recently participated were conducted.

Results: Four major themes were identified; 1) Understanding of pre-eclampsia, 2) Motivators for clinical trial participation 3) Barriers to decision-making and 4) Influence of PARROT Ireland on pregnancy experience. Barriers for participation identified by these women were; the subject being studied, the time commitment required and the possibility of taking a medication while pregnant. The main facilitators for participation in PARROT Ireland were that it did not involve taking a medication, the test was performed immediately and no follow-up appointments were required. The potential to benefit others in a future pregnancy also influenced their participation.

Conclusion: Women are generally interested and enthusiastic about participation in research during pregnancy. The potential of risk is an important consideration for eligible pregnant woman. Information and support by both researchers and clinicians is paramount in aiding women’s understanding of a research trial.
An audit of LLETZ procedure in a Cork City colposcopy clinic

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²Department of Gynaecology, Cork University Maternity Hospital, Cork, Ireland

**Introduction:** Large loop excision of the transformation zone (LLETZ) is the gold standard for treatment of cervical intraepithelial neoplasia (CIN), a premalignant condition of the uterine cervix. Excision depths should not exceed 12mm to minimise future obstetric risk. Prognosis is determined by the presence or absence of CIN at the margin of conisation. The aim of this study is to audit the LLETZ procedure in St Finbarr’s colposcopy clinic by assessing depth of excision and margin rates and comparing these with current guidelines.

**Methods:** A retrospective study of all LLETZ performed between January 2016 – March 2018. The following factors were analysed: age, indication for LLETZ, colposcopist seniority, disease severity, margin status, specimen dimensions and number of excisions.

**Results:** 694 LLETZ met criteria for inclusion in the study. The mean depth of excision was 8.57mm (SD: 4.4). 576 (83%) were ≤12mm. In total, there were 551 (79.4%) cases of CIN with 375 (68.1%) of these having high-grade dysplasia (CIN 3). Excisions were deeper when performed as a repeat LLETZ compared with first excision (mean 9.91mm versus 8.34mm, \( P = 0.001 \)). Positive margins were found in 212 (30.5%) excisions. Deeper excisions, high grade CIN and colposcopist seniority were not found to influence margin status.

**Conclusion:** Compliance with current guidelines on the use of LLETZ is good. However, excision depths exceeded 12mm in a number of cases. Depth of excision was greater in repeat LLETZ. No predictive factors for margin involvement were identified.
An analysis of potential drug-drug interactions in an aging HIV cohort.

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Introduction: The advent of antiretroviral drugs has transformed the treatment of HIV and has led to an increase in the life expectancy of patients. Patients are therefore more likely to acquire comorbidities which require pharmacological management. This increased pill burden is likely to lead to an increase in potential drug-drug interactions (PDDIs) between prescribed medicines.

Methods: The files of HIV patients aged 50+ (n=128) were examined to obtain demographic data, ART regimens and co-medications. Interactions were then screened for and stratified according to severity.

Results: 72.3% (94/128) of patients took at least one co-medication with 49.2% (63/128) of patients having at least one PDDI. A total of 23 category yellow, 81 category orange and 6 category red interactions were detected. Statins and Colecalciferol were found to contribute the most to PDDIs, leading to 19.1% and 17.3% of all PDDIs respectively. Cobicistat (29.4%) and integrase inhibitors (32.2%) were found to be the ART agents most likely to cause a PDDI. A correlation was found to exist between the total number of PDDIs and the number of co-medications prescribed (R= 0.621, p< 0.0001) and between number of PDDIs and a decreased CD4 count (R= -0.207 p=0.019) while age and gender were found not influence on the number of PDDIs to a statistically significant degree.

Conclusions: Owing to the necessity to prescribe for co-morbid conditions, it is almost inevitable that some of these medications will interact. It is therefore advisable to utilise an interaction checker database as well as careful clinical monitoring to optimise patient outcome.
Investigating the Impact of Hearing Loss on Clinical Interactions between Older Adults and Health Professionals

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Age-related hearing loss increases significantly in people aged 60 years and older. An ageing population with impaired hearing presents an additional burden to the multiple comorbidity found among older patients who are high users of medical services. Complex needs ask for the coordination of health and social care provided by multiple health professionals. This review quantifies the extent to which hearing loss is cited and/or accounted for in studies of older adult patient interactions with medical, nursing and allied health professionals.

A literature search was carried out within two databases, PubMed and SCOPUS, following PRISMA guidelines for systematic reviews. Studies published between 1980-2019, which focused on clinical communication with older adults were included. Thematic analysis was used to classify studies based on type of health communication.

Eighty-one studies involving ‘Physician’ or ‘Doctor’, and a total of 23 studies for ‘Nurse’, ‘Provider’ and ‘Therapist’, were included in the review. Twenty seven papers of 104 (25.9%) mentioned hearing loss; 15 only referred to hearing loss within the context of the text, four referred to hearing loss as an exclusion criterion, three showed an association between hearing loss and older patient communication with health professionals, and only two studies included an intervention.

Despite the known high prevalence of age-related hearing loss and its known impact on clinical communication, this review demonstrates that across the health professions, very few studies which have focused on health professional-older patient communication have incorporated hearing loss as a variable in their study design or analyses.
Strategies for Enhancing Resilience in Medical Students: A Group Concept Mapping Analysis

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Research has consistently shown that medical students have greater rates of stress and mental-ill health in comparison to non-medical students. The objective of this study was to investigate the resilience strategies employed by medical students in an Irish medical school to inoculate themselves against the deleterious effects of stress on health and wellbeing.

Group concept mapping was utilized incorporating qualitative and quantitative methodologies. The stages undertaken by 3rd year direct-entry medical students and 2nd year graduate-entry students at an Irish medical school involved brainstorming/idea generation, categorisation, and rating of resilience strategies students employed to manage stress during medical school. The data was analyzed utilizing The Concept System® software through multidimensional scaling (MDS) and hierarchical clustering.

Categories of resilience strategies employed included “friends and family”, “de-stress through exercise/sport” “extra-curricular non-medical activities”, “self-enabled distraction”, “organisation”, and “caring for mental wellbeing”. Students rated spending time with friends and family to be most effective in aiming to de-stress whereas students rated de-stressing through exercise/sport as being of greatest importance in relation to incorporating these strategies into a resilience-based intervention. Students recognized the value of taking care of one’s own mental wellbeing in integrating this strategy into a stress management programme. Self-enabled distraction rated poorly on both scales.

Strategies rated by students as important to incorporate in a stress reduction management programme are accessible, feasible and can be implemented into the medical curriculum.
Does Cannabis Use Predict Psychometric Schizotypy via Aberrant Salience?

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Cannabis can induce acute psychotic symptoms in healthy individuals and exacerbate pre-existing psychotic symptoms in patients with schizophrenia. Inappropriate salience allocation is hypothesised to be central to the association between dopamine dysregulation and psychotic symptoms. The present study examined whether cannabis use is associated with self-reported salience dysfunction and schizotypal symptoms in a non-clinical population.

910 University students completed a questionnaire battery comprising the following measures: the cannabis experience questionnaire modified version (CEQmv); schizotypal personality questionnaire (SPQ); community assessment of psychic experience (CAPE); aberrant salience inventory (ASI). Exploratory mediation analysis was used to test whether aberrant salience mediated the relationship between cannabis use and schizotypal symptoms.

Frequency of current cannabis use and age at first exposure was associated with increased positive and disorganised symptom dimensions of the SPQ, as well as increased aberrant salience. Higher aberrant salience scores were also correlated with higher levels of schizotypal traits. Both cannabis consumption and aberrant salience predicted variation across selected positive and disorganised SPQ sub-scales. However, aberrant salience fully mediated the relationship between current cannabis use and the increase in total SPQ and positive dimension scores. In contrast, aberrant salience partially mediated the positive association between current cannabis use and disorganisation dimension and sub-scale values.

Cannabis use was associated with both schizotypal symptoms and aberrant salience. Using self-report measures in a non-clinical population, the cannabis-related increase in positive and disorganised dimension scores was shown to be mediated by disturbance in salience processing mechanisms.
A Test of The Accuracy Of The Cuff Pilot Pressures On A Teleflex Unique Laryngeal Mask Airway (LMA) Cuff Pilot In Vivo

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LMA Intracuff pressure has a significant influence on postoperative outcomes. Overinflation leads to an increased risk of pharyngolaryngeal complications while underinflation increases the risk of aspiration. However, intracuff pressure is not routinely measured at present. The Cuff Pilot device is a novel built-in pressure gauge which gives a semi-quantitative, real-time reading in an easily-read colour coded format. Introduction of this device could allow continuous monitoring and optimisation of cuff pressure. The accuracy of this device in a clinical setting has yet to be established.

In this observational cohort study 42 patients from South Infirmary Victoria University Hospital who were undergoing elective surgical procedures in which LMA use was indicated were selected. Cuff Pilot colour zone and cuff pressure were recorded at insertion and again following optimisation as per the Cuff Pilot device. An external manometer was used to measure cuff pressure. Age, weight, gender, ASA grade and LMA size were also recorded.

The Cuff Pilot device accurately determined cuff pressure in 95.24% of cases. At insertion, optimal pressure was recorded in 33.33% of cases. The colour reading correlated with the external manometer in 85.71% of these cases. A suboptimal reading was recorded in 66.67% of cases. The readings correlated with the manometer in 100% of these cases.

Data analysis shows that the cuff pilot is a reliable way to measure intracuff pressure in a clinical setting. No factors which could cause inaccurate readings were identified. In the majority of cases, insertion pressure was outside of the optimal range.
Age-related Hearing Loss and Patient-Provider Communication across Primary and Secondary Care Settings: A Cross-sectional Study

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The prevalence of hearing loss increases with age. Older adults are the most dependent users of the healthcare system, and a high prevalence of medical error is observed in this population. Failures in clinical communication are the leading cause of medical errors. This study examines whether the patients with age-related hearing loss are being appropriately served in primary and secondary healthcare settings, as well as assessing the contribution of communication deficits due to age-related hearing loss to occurrence of medical error.

A cross-sectional 17-item quantitative survey was distributed to a random sample of Irish primary care physicians, as well as Irish hospitals and healthcare teams associated with palliative care and geriatric services.

172 general practitioners and 100 secondary care providers (physicians, nurses, allied health professionals) completed the survey. 93% agreed that hearing loss in older is associated with a negative impact on the quality of care given to older patients during a consultation. A minority of respondents had completed formal training for communicating with patients with hearing loss, although 66.5% expressed comfort with their communication skills when treating older adults with hearing loss. 10% of respondents across both settings claimed that such communication issues contributed to medication error at least several times a year.

All healthcare providers report that they incorporate several strategies during consultation in order to maximise the efficacy of communication with older patient with hearing loss. They also report that communication breakdown with these patients has resulted in errors with significant negative consequences for the patient during the previous year.
CRF-C Study Coordinator Survey: Challenges Experienced During Clinical Trial Conduct

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**Background:** Patient recruitment is critical to clinical trial success. Recruitment is also one of the most challenging aspects of conducting clinical trials, with a substantial number of trials failing to reach their recruitment target. Insufficient recruitment can have considerable ethical, clinical and policy implications. Underpowered studies, due to insufficient recruitment, can give rise to type II errors which may lead to effective treatments being discarded before establishing the true value or effect.

**Methods:** Studies conducted in CRF-C which closed between January 2018 and April 2019 were reviewed. Study co-ordinators were interviewed to gather information regarding general study statistics and challenges faced during study execution. The data was analysed to explore and identify the main difficulties experienced during clinical trial conduct.

**Results:** 17 studies across 6 therapeutic areas were reviewed. Recruitment was the most widely reported challenge, with restrictive eligibility criteria cited as a recruitment challenge in 6 (35.3\%) trials. Of the 6 studies that reported this challenge, 5 failed to reach recruitment target. Screen failures, recruitment windows and “other” challenges were also reported. Retention was not reported as a challenge in any of the trials.

**Conclusions:** Recruitment was identified as the principal challenge, with restrictive eligibility criteria being cited as a factor affecting recruitment by multiple study coordinators. Critical assessment and development of a recruitment plan during the feasibility process should be employed to mitigate against under recruitment in clinical trials.
Microbial Regulation of Tryptophan Metabolism: Focus on Gastrointestinal and Hepatic Gene Expression

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Microbial regulation of tryptophan metabolism, an essential amino acid and precursor to serotonin and neuroactive kynurenine pathway metabolites, represents a potential mechanism underpinning the influence of the microbiome-gut-brain on brain and behaviour. Both the gastrointestinal tract and the liver are major sites of host tryptophan metabolism, including the production of serotonin (5-HT) by tryptophan hydroxylase (TPH1) and kynurenine pathway metabolism by indoleamine 2,3-dioxygenase (IDO1), tryptophan 2,3-dioxygenase (TDO2). The gut microbiome influences both gastrointestinal and hepatic gene expression, but the contribution of this crosstalk to the circulating availability of tryptophan and its metabolites is currently unknown. This study aims to investigate into the effects of the gut microbiome on the expression of host genes for tryptophan metabolism in germ-free, colonized germ-free and conventionally colonized male and female mice. Expression of TDO2, TPH1 and IDO1 mRNA was analyzed by qRT-PCR. Our results demonstrate that the expression of rate-limiting enzymes of the kynurenine pathway and serotonin pathway – IDO1 and TPH1 respectively- seems to be sex and/or region-specific in the gut and that colonization of GF mice can restore expression to a conventional-like level. The expression of TDO2 in the liver is significantly lower without a gut microbiome, consistent with the higher circulating tryptophan and kynurenine profiles noted in GF animals in earlier studies. Further studies are required to understand the microbial mediators involved in this crosstalk between the gut microbiome and the host, both in the liver and the gastrointestinal tract, and to determine if is possible to manipulate this relationship to control gut-brain axis signalling.
Background: Patient and Public Involvement (PPI) in health research is becoming more prevalent worldwide. A formalised and widespread approach to PPI is a relatively new concept in Ireland. Ireland’s largest state funding agency is now encouraging researchers to involve patients and the public in research. This is likely to result in increased awareness and participation in PPI.

Objectives: To examine current levels of PPI within the Clinical Research Facility Cork (CRF-C) and University College Cork (UCC) and to explore researcher and public perspectives of implementing a PPI service in UCC.

Methods: 78 UCC Researchers and 51 Public representatives from patient support groups across Ireland completed an online survey. Quantitative and qualitative data were analysed.

Results: High levels of public involvement were reported by both groups, although qualitative analysis suggested that some respondents misinterpreted PPI as being participants in a research study. The main barriers identified were lack of awareness amongst researchers of PPI and how to access PPI representatives. The public were less convinced than the researchers about the level of impact PPI had on projects. There also appeared to be a contrast in priorities of where the public could contribute most effectively in future studies. Researchers want to involve the public in their research. Both groups were interested in receiving training in PPI, albeit researchers more so than the public.

Conclusions: The survey provided a snapshot of how PPI was being integrated in UCC led research projects and highlighted the need for training and support resources. The results will inform a strategy for implementing a PPI service in UCC.
Brain Imaging at the Time of Diagnosis of Lung Cancer. A Large Retrospective Study of Compliance with National Guidelines.

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One recent National Cancer Control Program (NCCP) lung cancer guideline focused on areas of lung cancer management with variation in practise, emerging evidence or uncertainty including highlighting the importance of brain imaging in patients with stage III non-small cell lung carcinoma (NSCLC) undergoing treatment with curative intent and limited small cell lung carcinoma (SCLC). However, brain imaging was not recommended in patients with stage I and II NSCLC.

Our objective was to determine in our institution if patients with NSCLC or SCLC are undergoing appropriate brain imaging within 60 days of initial diagnosis as per NCCP guidelines through analysing all patients presenting in 2016.

All 300 patients were included 252 (84%) NSCLC, 48 (16%) SCLC. All asymptomatic NSCLC stage I or II patients did not receive brain imaging as per NCCP guidelines. 48 patients had stage III NSCLC. 41 underwent treatment with curative intent, and only 13 received brain imaging (32%). Amongst those with limited SCLC (n = 13), 1 patient (7.7%) did not receive brain imaging.

With regards to the NCCP guidelines, our centre is compliant in stages I and II NSCLC and limited SCLC. However, we are not compliant regarding brain imaging in stage III NSCLC undergoing curative intent.
The relationship of athlete factors and patient reported outcomes on return to play 1-year post ACL reconstruction

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Background: Anterior cruciate ligament (ACL) tears are the most frequently reported knee injury in athletes. For those who wish to return to play (RTP), ACL reconstruction (ACLR) is recommended to restore knee function and stability. Knowledge of important predictors of RTP post-ACLR can aid surgeons and allied health professionals to effectively manage athletes’ rehabilitation expectations. The purpose of this study was to determine which athlete factors and patient reported outcomes predict RTP at 1-year post-ACLR.

Methods: This prospective cohort study recruited 336 participants who underwent ACLR at SSC in Dublin. Data collected included; baseline demographics, details of sport participation, injury mechanism, intent to RTP and patient-reported outcome measure (PROM) questionnaires at baseline (Marx, ACL-RSI) and at 1-year post-ACLR (Marx, ACL-RSI, Cincinnati, IKDC). Participants were categorised based on successful RTP 1-year post-ACLR. Univariate and multivariate logistic regression analysis were used to evaluate the association between RTP and athlete factors and PROMs.

Results: Two hundred (65.45%) participants RTP at 1-year post-ACLR. Participants were more likely to RTP if they were younger (OR:0.972, 95%CI:0.952-0.995), intended to return to a higher level of sport (OR:2.125, 95%CI:1.169-3.861), had higher baseline Marx scores (OR: 1.066, 95%CI:1.022-1.111), and higher Marx (OR:1.291, 95%CI:1.214-1.373) and IKDC scores at 1-year postoperative (OR:1.065, 95%CI:1.041-1.088). Higher Marx scores at 1-year postoperative (OR:1.291, 95%CI:1.214-1.373) were the only significant predictors of RTP.

Conclusion: Patients were more likely to RTP if they had better functional activity outcomes at 1-year post-ACLR, suggesting that PROMs can be used to assess how likely an athlete is to RTP.
The incidence of fatal fetal anomalies associated with perinatal mortality in Ireland

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Background: Little is known about what conditions are most responsible for perinatal mortality. While there is no universally-agreed definition in Ireland, the term fatal fetal anomaly (FFA) is used in Law to describe a condition likely to lead to death of the fetus in utero or within 28 days of birth.

Aim: To identify what congenital anomalies (CAs) are responsible for perinatal death and whether they are classified as a FFA in accordance with the criteria implemented by the Irish legislation.

Methods: Anonymised data pertaining to perinatal deaths from 2011 to 2016 in Ireland were obtained from the National Perinatal Epidemiology Centre. Secondary data analysis were conducted using SPSS.

Results: Of the 2,638 perinatal deaths, 939 had an associated congenital anomaly (CA). Following the removal of unspecified deaths there were 779 CA related deaths, of which 42.1% (n=328) were considered a FFA. Nearly half of the conditions were classified as chromosomal (43.2%, n=406 of 939). There were more than one anomaly present in 35.5% of the cases (n=333 of 938).

Conclusion: This study found that over a third of CAs were deemed a FFA. There is a need for a universal term and definition that represents fetuses/infants with conditions that cause perinatal death. Many of the conditions in isolation may not be a FFA however, when combined they have the potential to be fatal. As these cases are complex, knowledge is required to inform clinical practice and appropriate counselling of parents who receive a diagnosis of a fetal CA.
Delphi Survey: Exploring what education is priority for voluntary organisations who deliver supports to parents who experience perinatal loss

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Background: Following pregnancy loss parents require various levels of support during their bereavement. There is a reliance on voluntary organisations to provide supports. While willing to fill these gaps in care, some may lack the expertise to provide the level of care required by families. Education is essential in healthcare in order to keep up-to-date with best practice.

Aim: To explore what education was priority for support groups who provide supports to parents who experience pregnancy/perinatal loss. To develop, deliver and evaluate an education day.

Methods: A modified Delphi study was undertaken to identify education needs. There were two Delphi rounds, inclusive of free text, where participants reflected on responses in order to develop a consensus among the expert group. The education day was evaluated using a likert scale and free text.

Results: All 23 organisations offered supports to parents who experienced various types of pregnancy/perinatal loss. There were 12 responses to round one and 7 responses to round two of the Delphi study. Round one identified 64 sub-topics which were then determined as essential, desirable or not relevant in round two by the expert group. The final 56 sub-topics were themed together and were chosen for inclusion in the education day. The education day was positively evaluated.

Conclusion: This study identified educational needs of voluntary support groups. A standardised approach was necessary to guide the development of an education day responsive to voluntary support groups learning needs. Thus, assisting them in supporting parents who experience pregnancy/perinatal loss.
What are the Factors Affecting Well-Being in China?

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Many prominent theorists have argued that accurate perceptions of the self, the world, and the future are essential for mental health (Taylor, 1988). The ability to be happy has been one central criterion of mental health and well-being adopted by a variety of researchers and theorists (Menninger, 1930). The analysis of ‘subjective well-being’ is also a rapidly growing topic for economists (Knight, Lina, and Gunatilaka, 2009).

Well-being benefits from factors, flow more directly than the effects flow through productivity and economic growth. Communities and governments are increasingly interested in using subjective well-being to supplement conventional economic measures of individual and social progress (Helliwell, 2011). China, as the world second largest economy, its people's well-being levels should be paid attention.

The aim of this paper is to explore the possible factors effecting subjective well-being in China by using the data of Chinese General Social Survey 2015. The aim is achieved under the utility theory by analysing the relationships between factors and happiness. When measuring individual well-being levels, the self-reported happiness indicators are adopted. The methodology of this analysis in this paper is using ordered probit technique.

This paper contributes to the area that what factors influence individual’s subjective well-being in China. The results show that gender, age, health status, religion, education level, income, political status, marital status, social frequency and social fairness, significantly effecting individual’s well-being in China. This research suggests that except person’s character factors, for these factors like education level, income, social fairness, government could improve more directly to enhance people’s happiness level.
A Retrospective Review of Outcomes in Patients on Haemodialysis with Infected Arteriovenous Grafts

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Introduction: While an autogenous native AVF remains the ideal choice of vascular access for haemodialysis, in patients who have exhausted AVF options or with small native veins, an AVG is usually created. AVGs are more prone to infection compared to AVFs, and AVG infections can lead to disastrous repercussions. Thus, we aim to review and audit the outcomes of patients with infected AVGs.

Methods: We conducted a retrospective review of all patients who underwent AVG creation from January 2014 to December 2018 in our institution and patients who developed an AVG infection were identified. Patient demographics, AVG characteristics, microbiological data, and management options were obtained after review of electronic medical records.

Results: 142 patients underwent AVG creation, of which 15 episodes of AVG infection (10 upper limb and 5 lower limb) arose in 11 patients. 2 patients had recurrent AVG infections, and 60% were thrombosed on presentation. The median age was 61 and 72.7% had known diabetes mellitus. 46.7% patients had AVG appearing to be primarily infected, such as from needling. The remaining 53.3%, had AVG appearing to be secondarily infected from a distant primary source, such as from severe cellulitis. The most common microorganisms involved in AVG infections are Staphylococcus Aureus, Pseudomonas Aeruginosa and Enterobacter Cloacae. 80% of patients required surgery, whereas the rest were treated conservatively. If the AVG is unsalvageable, the median time to new access creation is 5 months.

Conclusion: Infection is a serious complication after AVG creation which can lead to access loss. Surgery remains the mainstay of treatment in patients with AVG infection.
Retrospective Review of Admission Trends for Older-Adults to an Acute Mental Health Unit for Cork 2006-2017

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Background: The ageing population is increasing with projections for 16% of the population to be aged 65 years and over by 2026 and 19.7% by 2036. There is a high prevalence of mental disorders in the older-adult population, with significant associated morbidity, and unmet mental health service need.

Over the past decade, the Mental Health Service for Older-Adults has developed for the South-Lee Catchment area in Cork with expansion of a multidisciplinary team and appointment of a second Consultant Old Age Psychiatrist. During this time, the Acute Mental Health Unit(AMHU) moved to a new purpose-built facility at CUH campus with 8 designated older-adult beds.

Aim: To describe admission trends for older-adults to an acute mental health unit(AMHU) over the ten-year period 2006 – 2017.

Methods: Data was extracted from the hospital’s National Psychiatric Inpatient Reporting System database to inform our retrospective review.

Results: From 01/01/07 to 31/12/16, 820 older-adults were admitted to the AMHU, 40.2% (n=330) male, 59.8% (n=490) female. The mean age was 73.9 years +/- SD 6.3. The mean admission duration was 44.3 days +/-SD 58.9. The number of admissions under the Mental Health Service for Older-Adults increased from 19 in 2007 to 62 in 2016. The percentage of older-adult admissions treated by General Adult Psychiatrists compared to Old Age Psychiatrists reduced from 72.1% in 2007 to 36.1% in 2016.

Conclusions: In an ageing population, expansion of a mental health service for older-adults has been accompanied by a trebling of inpatient mental health unit activity over a ten-year period.
Stigmatization, Self-esteem and Mental Health in Chronic Pain Patients

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Introduction: One in three people in Ireland have chronic pain (CP). Stigmatisation of CP is associated with lowered self-esteem and increased risk of depression and anxiety. In the South-South-West-Hospital-Group, there is no dedicated MDT pain-management-programme.

Aim:

1) To quantitatively evaluate the level of stigmatisation and self-esteem experienced by outpatients with chronic pain, using a convenience-sampling technique

2) To screen for Depression and Anxiety

Methods: Outpatients with chronic pain (n=200) completed a set of validated questionnaires including the Stigmata Scale for Chronic Illness (SSCI), Rosenberg’s Self-esteem Scale (RSES); Brief Pain Inventory short form (BPI); and the General health survey (SF12v2) and the Hospital Anxiety Depression Scale (HADS).

Results: Our study population (n=160) was 69% female, 64% unemployed. 77% had lowered self-esteem (RSES score = 17.2 + 14.5) and high levels of stigmatisation [mean (sd) SSCI score 50.85 (19.02), (range 24-120)]. An inverse relationship between stigmatization and self-esteem (Pearson correlation, r = .58, p<0.001) and self-esteem and pain-interference (r=.48, p<0.001) was identified. A positive correlation between stigmatization and anxiety (r=.228, p<.05) and an inverse relationship between self-esteem and depression existed (r=.234, p<.05). 49% scored within the moderate-severe range for anxiety. 35% scored within the moderate-severe range for depressive symptoms.

Conclusion: A significant proportion of patients with chronic pain (n=160) in Ireland report moderate-severe symptoms of anxiety (one in every two outpatients) and depression (one in every three outpatients). 77% of CP patients report lowered self-esteem, which was associated with higher levels of anxiety and depression. This highlights the high rates of psychiatric co-morbidity and the need for a resourced Pain-management-programme.
P023

Pulmonary Carcinoids: A case series comparison of Typical and Atypical carcinoids as seen in Cork University Hospital.

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Background: Pulmonary carcinoid tumours represent 2.5% of our total thoracic tumours (PCT) and are divided into two distinct subclasses, typical carcinoids (TC) and atypical carcinoids (AC) with different treatments and prognosis.

Methods: This study is a single center retrospective case series of patients identified through the thoracic oncological multidisciplinary meeting in Cork University Hospital. Patients with a biopsy proven carcinoid between the years of 2012 to 2016 were included in this cohort.

A total of 43 patients were identified. Six were excluded due to absence of tissue confirmation or loss to follow-up. Thirty-seven patients were included in this case series.

Results: AC represented 7/37 (19%) cases in this cohort. The average age of TC and AC was 56 (+/- 17) years and 62 (+/- 13.5) years respectively. Female patients represented 20/30 TC (66.7%) and 4/7 AC (57%). Asymptomatic presentation occurred in 43% TC (13/30) and 42% AC (3/7). Four patients presented with carcinoid syndrome of which, all were TC. The majority (84%) underwent surgical intervention. TC were followed on average for 34 months and had a recurrence rate of 14%. AC were followed for longer at 41 months with a higher recurrence rate of 25% (P=.106).

Conclusion: PCT represent a small percentage of our total thoracic tumour population with infrequent carcinoid syndrome. The majority of patients undergo surgery with a higher recurrence rate in patients with AC.
The interaction of presbycusis and SALADs on medical error.

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Our ageing society and advancing medical breakthroughs has brought with it new challenges for our health care system. This study in particular hopes to highlight presbycusis, the most common cause of sensorineural hearing loss, and sound-alike, look-alike drugs (SALADs), a group of medications whose names either look or sound similar. Both SALADs and presbycusis, as individual variables, have been associated with medical error. However, few studies exist on interaction of these variables on patients’ ability to correctly identify medication.

A single-blind randomised control trial was carried out with 41 university students. This group was chosen to limit confounding variables such as Presbycusis and age related-cognitive decline. The group was divided into the control and presbycusis groups. Both groups saw identical videos of a person saying 15 SALADs. However, presbycusis group’s video had the sound distorted by 50dBs to simulate presbycusis.

Overall correct SALADs identification was decreased by 3.9% in the presbycusis group compared to the control (p<0.05). Despite decreases of up to 14% between individual SALAD identification, no result showed any statistical significance between the groups. The control group subjects perceived that they scored 7.1% lower than their actual result (p<0.001), while the presbycusis group perceived that they scored 8.2% lower (p<0.05).

In a controlled environment the interaction of presbycusis and SALADs negatively affected health care communication. This study illustrates how the potential for medical error can be attributed to an often-overlooked aspect of patient interaction in a healthcare environment.
The prevalence and correlates of smoking in an Irish university population, focusing on social smoking and self-identification of smokers: a cross sectional study

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Background: Social smoking is increasingly common, emerging as a separate pattern of smoking behaviour to regular smoking. Smoking denial is also more prevalent, with those who engage in smoking behaviour often not self-identifying as smokers. This study aims to examine the prevalence of smoking and social smoking in Irish university students and the self-identification of same, along with assessing other factors for any association they may have with smoking behaviour, namely smoking identity, frequency of tobacco consumption and alcohol and drug use.

Population: A web questionnaire was distributed to undergraduate students of University College Cork. The final sample size was 1,434 participants, a response rate of 10.4%.

Results: 58.2% of respondents are smokers with 77.2% of those being social smokers. Social smoking has significant associations with a number of smoking characteristics including decreased frequency of habit, sourcing tobacco from others, less inclination to quit and being influenced to smoke while drinking or if others are smoking. Only 12.3% of social smokers self-identified as smokers. Smoking was strongly associated with substance use and drinking to excess.

Conclusions: Social smoking constitutes the majority of smoking behaviour amongst those surveyed. The difference in results between social smoking and regular smoking groups reinforces social smoking as a distinct smoking pattern. There is a vast discrepancy in the self-identification of smokers and their smoking behaviour, more so amongst social smokers than regular smokers. Further study could be carried out in this area with regards to smoking interventions and potential need to target these groups specifically.
The accessory nerve course variation and surgical risk assessment: a cadaveric study

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Accessory nerve (AN) is the eleventh cranial nerve and has a long, superficial course from its origin in the nervous system to its insertion into the trapezius muscle. Thus, making it prone to iatrogenic damage. The course variation of the AN has been extensively documented in the literature due to its relevance to surgery risk assessment, particularly in the posterior neck triangle. However, limited knowledge regarding the most distal part of the AN was available in the literature. Here, we addressed this gap in anatomical knowledge and its clinical relevance, and identified other variations of the nerve. In this research we utilised formalin-fixed and saline-preserved cadavers to trace the AN from the trapezius to the jugular foramen via the posterior cervical triangle and sternocleidomastoid muscle. A general pattern to the course of the AN was identified, with a number of clinically significant variations: two types of sternocleidomastoid innervation by the AN were encountered, nerve branching/plexuses to the proximal trapezius muscle in the supraspinous area was identified in all cases. Additionally, an unusual loop structure formed between the accessory and the cervical nerves was found in two specimens. The number of cervical nerves contributing to trapezius innervation varied between 1-3, whereas the number of terminal branches to the trapezius ranged from 2-5. To conclude, we elucidated certain patterns of innervation and variations which may help clinicians localize the nerve during preoperative planning. New anatomical knowledge regarding the AN was generated, and the differences between soft- and hard-fixed cadaveric dissections were assessed.
An Epidemiological Study Of Severe Penetrating Trauma In The South of Ireland

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Objective: This study aims to identify several epidemiological parameters of severe PI and explore the initial management of this patient cohort in Cork University Hospital (CUH).

Design and Method: All penetrating injuries presenting to CUH ED were analysed from the Trauma Audit Research Network (TARN) database. Data extracted from the TARN database was then analysed under specific headings and conclusions drawn. Data was exported to Excel & SPSS software for statistical analysis.

Results and Conclusions: There were 41 cases of penetrating injuries that presented to CUH ED from January 2014 to January 2018. Preliminary analysis shows that males are significantly more affected than females representing 87.8\% (n=36) and mean age was younger in males (35.3 ± 14.6 years) compared to females (42.9 ± 14.6 years). The most common mechanism of injury was stabbing, representing 78\% (n=32) of the studied population while the most affected anatomical site was the chest (46\%, n= 19). The mean length of stay (LOS) for penetrating injury patients was 15 days. Mortality at 30 days for this cohort of patients was 3 patients (7\% of population studied). Injury severity (ISS) for half the patients was ISS >15 (n=20). The median time to a CT scan for these patients was 82 minutes. 61\% of penetrating injuries required an operation while the mean number of operations required for resolution was 2.

This clinical information in an under-studied area will provide important data on improving our management of these patients however more research in this field is required.
An investigation into potential prognostic indicators in a large cohort of patients with small cell lung cancer (SCLC)

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SCLC is a highly aggressive, undifferentiated neoplasia that originates from the precursors of neuroendocrine cells and is characterised by a high proliferation rate and early metastasis. \cite{1} The aim of this research was to investigate the potential prognostic benefit of several clinical and lab-based variables in all patients radiologically diagnosed with SCLC in CUH between 2011 and 2014.

All patients with SCLC diagnosed through CUH MDT between 2011 and 2014 were identified. Data for potential prognostic indicators was analysed using Kaplan-Meir Curves and Cox Regression Analysis on IBM SPSS v25.

Initially, 116 patients were identified, however 39 were excluded due to lack of data, leaving 77 patients to be included in the study (mean age = 66, female = 43\%). Factors that had prognostic significance following univariate analysis were age, disease extent, gender, albumin, neutrophil to lymphocyte ratio, and urea. Disease extent, age at diagnosis and NLR were found to be independent prognostic indicators following multivariate Cox regression analysis.

In conclusion age and extensive stage were, as expected, associated with poor prognosis. The association of NLR with poor prognosis requires further investigation in the era of immunotherapy for lung cancer.

TitleGut-brain axis in young binge drinkers

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Binge drinking (BD) is defined as the consumption of six or more standard drinks in one session. This pattern of consumption is highly prevalent during adolescence, which is considered to last up to 25 years of age. This developmental period involves ongoing neuromaturation that results in greater vulnerability to disruptive events in the brain such as excessive alcohol consumption. BD has been associated with both neuroanatomical impairments and neuropsychological deficits. Accumulating evidence indicates that chronic alcohol consumption induces inflammation, both from a direct interaction with the brain and the periphery, particularly from the gut. Recently, chronic alcoholism has been linked with increased intestinal permeability and alteration of microbial profile, in rodents and humans. However, no study to date has investigated the gut microbiota in young people with a repeated pattern of alcohol intoxication. The aim of this study is to investigate the potential link between alcohol-induced altered microbial profile, pro-inflammatory markers, hypothalamic-pituitary adrenal (HPA) activity and neurocognitive functioning in healthy young BDs. We will characterize both basal and stimulated immune/inflammatory markers in peripheral blood, as well as measuring the acute stress response by analysing salivary cortisol levels (cortisol awakening response [CAR]). The Cambridge Neuropsychological Test Automated Battery (CANTAB) will be used to assess neurocognitive performance. In addition, we will evaluate cognitive and affective dimensions highly linked to escalation in drinking severity such as emotional regulation. We will propose and discuss the results within a neuro-immuno-affective framework to integrate recent evidence on how central and peripheral alcohol-derived inflammation might damage the still developing young brain.
Primary brain tumours have an incidence of 8/100,000/year in Ireland. 80% of these tumours are adult diffuse infiltrating gliomas, and the majority are high grade, causing death within two years. Obstacles to treatment include impossibility of complete surgical resection, outward convection pressures, first-pass metabolism, the blood brain barrier, and the existence of cancer stem cells, reigniting malignant growth following treatment.

Retinoic acid and its synthetic analogues, the retinoids, are potent, lipophilic differentiation agents capable of crossing the blood brain barrier. They have recently been considered as potential adjuvant therapy to trigger the terminal differentiation of glioma cells. Retinoids act via a family of nuclear retinoic acid receptors (RARs) that stimulate the expression of target genes. Three genes exist for RARs (RARA, RARB, RARG). Each gene encodes multiple functional isoforms differing in the N-terminus active protein domain. Most studies examining their expression in tumours have focused on the common regions, not differentiating between the various isoforms. Previous studies highlighted tumour suppressive functions for some RARB isoform (RARB2) while others (RARB1) were shown to stimulate proliferation. Considering the potential therapeutic benefit of retinoids and the mixed functions of RAR isoforms, we wish to determine the role of specific isoforms in controlling glioma growth. To date, our results show that expression of specific isoforms is associated with growth suppression while others are associated with increased proliferative rates. We propose that differential manipulation of RAR isoforms may be key in targeting tumour suppression.
Whey protein effect on adiposity, metabolism and gut permeability in high-fat diet fed mice during gut microbiota depletion

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Whey protein isolate (WPI) is considered a dietary solution to obesity due to its beneficial effect on energy balance, adiposity and metabolism. However, the mechanism of WPI action is still poorly understood. It has been shown that a high-fat diet (HFD) containing WPI causes changes in the composition of the gut microbiota.

This study aims to determine if the gut microbiota mediates physiological and metabolic changes observed during HFD-WPI administration.

Seventy-eight 5-week old mice were divided in eight groups and received a high-fat diet containing WPI (HFD-WPI) or the control non-whey milk protein casein (HFD-CAS) for 5 weeks or 10 weeks respectively. Four groups underwent gut microbiota depletion by chronic antibiotic cocktail administration in drinking water (1 g/L Ampicillin, 0,5 g/L Neomycin, 0,35 g/L Vancomycin).

At 5 and 10 weeks, the HFD-WPI group showed a reduced weight gain, adiposity and plasma leptin levels relative to the controls. The groups treated with antibiotics showed reduced weight gain, adiposity and plasma leptin levels compared to non-treated animals, especially following 10 weeks of WPI intake.

In the gut, mice fed a HFD-WPI showed no increase in ileal permeability or peripheral inflammatory markers MCP-1 and IL6, relative to their CAS counterpart. These changes were completely abolished in antibiotic-treated mice.

These results suggest that WPI given with HFD have a positive effect in weight gain and adiposity which is not mediated by the gut microbiota but, probably, by adipose tissue metabolism control. Conversely, lower ileal permeability and inflammation caused by WPI are microbiota dependent.
The added utility of the Extended Myositis Antibody panel to the clinical and pharmacological management of suspected inflammatory conditions

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\textbf{Background:} The idiopathic inflammatory myopathies are a rare collection of disorders characterised by proximal muscle weakness, cutaneous manifestations, Raynaud’s syndrome, interstitial lung disease and arthropathy. Introduction of the EMA panel, testing for myositis specific and myositis associated antibodies (MSA/MAA) provides an additional mode of investigation to further refine inflammatory diagnoses and management.

\textbf{Objectives:} The objectives of the study are:

1. To determine autoantibody prevalence from EMA panels
2. To identify disease manifestation in those with a positive result
3. To establish if presence of autoantibodies alters a diagnosis or treatment

\textbf{Method:} This is a retrospective chart review of CUH patients with a positive EMA panel test between January 2013 and June 2018. Data was obtained from CUH immunology lab archives, supplemented by patient charts and analysed using SPSS.

\textbf{Results:} 25.5\% (86) of 337 EMA panel tested positive for MSA/MSAs. The most prevalent antibodies were Ro-52 (33\%), PMSCl-75 (18\%), Mi-2a/b (15\%) and TIF1-gamma (10\%). The most common disease presentation was ILD at 57\% followed by arthropathy with a prevalence of 30\%. Raynaud’s, myositis and cutaneous lesions were present in approximately 29\% patients. Patient diagnosis was adjusted in 40\% and 62\% experienced improvement in symptoms subsequent to medication alterations.

\textbf{Conclusion:} The EMA panel lead to a change in diagnosis for patients with subsequent adjustment of treatment and improvement of disease manifestations. 39\% patients went on to have a myositis-related diagnosis following EMA test proving its use clinically. However, due small population size a longer-term study is required to precisely elucidate correlation between antibodies, diagnoses and treatment.
Melanoma conditioned medium promotes cytotoxic immune responses by murine bone marrow derived monocytes despite their expression of ‘M2’ markers

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Macrophages have been shown to infiltrate a wide range of malignancies and are often considered to promote tumour survival, growth and spread. However the source and behaviour of discrete tumour associated macrophage populations are still poorly understood. Here we show a novel method for the rational development of bone marrow derived monocytes appropriate for the study of processes which involve the contribution of circulating inflammatory monocytes. We have shown in response to tumour conditioned media these cells upregulate CD206 and CD115, markers traditionally associated with M2-type macrophages. Treated cells show reduced capacity for cytokine secretion but significantly impact CD4 + and CD8 + T cell proliferation and polarization. Coculture with treated cells significantly reduced CD4 + T cell proliferation but increase CD8 + T cell proliferation with significant induction of IFNγ secretion by both CD4 + and CD8 + T cells, indicating these cells may have a role in promoting anti-cancer immunity.
Clinical evaluation of the presence of macrophages in melanoma and their effect on intratumoural gene expression

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Macrophages are a phenotypically diverse group of cells that have been implicated in supporting tumour growth, survival, metastasis and immunosuppression. Previous reports have suggested that macrophages can account for up to 50% of the mass of human melanoma. Macrophage infiltration has been shown exert prognostic effects in a range of solid cancers. While in vitro studies have shown compelling evidence to suggest these cells play a negative prognostic role in melanoma, no studies have been able to conclusively show a link between macrophage infiltration and survival, and there have been no clinical reports to suggest that macrophage infiltration can impact the efficacy of targeted therapies such as BRAF inhibitors, MEK inhibitors or T cell check point inhibitors. One hypothesis to explain this is that while tumour-associated macrophages (TAMs) adopt an M2 phenotype, they are functionally repressed in the tumour microenvironment and become quiescent. To test this hypothesis we examined the CD68+ and CD163+ macrophage infiltration in human melanoma, and total gene expression within the tumour.
What do healthcare professionals and researchers think about blogs as a means to translate research findings?

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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, such as healthcare professionals and the public, as well as other researchers. As part of the knowledge exchange and dissemination activities of the Model for Dementia Palliative Care Project, this study aims to explore what different stakeholders think of blogs as a means to translate research findings.

Methods: A web-based survey was developed, piloted (n=6), and revised (n=2). It was distributed electronically to five Irish Universities, shared via Twitter and included in two Irish newsletters. Data were analysed using SPSS and Content Analysis.

Results: Complete responses were received from n=200. The majority of respondents were healthcare researchers, followed by healthcare providers. The preferred methods of reviewing research findings chosen were scientific papers, websites and news articles. Email notification's increased the likelihood of reading a new blog for more than half of respondents. Barriers identified to engaging with blogs included time, preference for other means, awareness of available blogs, and concerns about the credibility and source of information. Length of the blog and the author of the blog were important features which encouraged engagement with a blog.

Conclusion: Despite many respondents still choosing a scientific paper as their preferred way to consume research findings, many indicated openness to reading blogs in their area if they were available. Creating concise, relevant and credible blogs, and suitably promoting these, may increase the impact and reach of academic research within the health sector.
Effect of electrochemotherapy with cisplatin and oxaliplatin on expression of pattern recognition receptors on lung cancer cells and immune cells – *in vitro* study design

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Electrochemotherapy (ECT) is a cancer treatment utilising electroporation (EP) in combination with chemotherapies. It’s applied to many cancers including melanoma and colon cancer. Despite the effort in improving the effectiveness of ECT, ECT is still offered predominantly as a palliative treatment. ECT has shown great effectiveness in reducing the local tumour burden and is well tolerated by most patients, but ECT lacks a systemic immune response [1], [2]. The killing effect of ECT on tumour cell is well established, but despite ECT not leading to a systemic response, little attention has been paid on immune-related effects of ECT on cancer and immune cells.

A sufficient and long-lasting immune response is necessary to create a systemic immune response that targets metastasis, but can also create immunological memory, so that reoccurrence of the same cancer type is minimized [3],[4].

The tumour microenvironment consists of a variety of cells including cancer and immune cells[5]. When ECT is applied to the tumour, electroporation has the potential to effect immune cells as well as the cancer cells. This study explores the effect of ECT on cancer and immune cell permeability, long-term survival and immune profile.

Method: Electroporation of cell types with various field strengths to establish the effect of EP on cell permeability and survival as well as metabolic activity. ECT will be performed with standard ECT drugs followed by the assessment of cell survival, metabolic activity and immune profiling.
A Phase 1, Single-Blind, Placebo-Controlled, 3-Arm Cross-Over Trial of Food-Grade Ghrelinergic Peptides

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Rationale: Methods to stimulate appetite in the sick or elderly remains a challenge with few safe therapeutic options. Ghrelin has received considerable attention as a therapeutic target to stimulate food intake in patients with anorexia.

Methods: A single-blind, 3-arm (placebo, casein bioactive MF1145 and whey bioactive UL-2-141) cross-over trial was conducted in healthy male volunteers. Participants received 26 mg/kg of both bioactives and placebo. Outcome measures were energy & protein intake from an ad libitum lunch and total daily intake as well as subjective appetite sensations as assessed by visual analogue scale (VAS). Basal and postprandial levels of active ghrelin (AG) were measured.

Results: Overall, 22 male participants (mean age 27 years) were included. Mean energy and protein intakes at lunch when treated with placebo were 1343 kcal (95% CI: 1215 – 1471 kcal) and 74g (95% CI: 66 – 81 g), respectively. Energy and protein intakes at lunch and subjective appetite, hunger and satiety ratings on VAS were not significantly different from placebo for either treatment. Total daily protein intake was 23g higher in those who were treated with UL-2-141 compared to placebo (p=0.044). AG area under the curve was not different across treatment groups.

Conclusions: While these peptides demonstrated ghrelinergic effects in rats, only total daily protein intake was increased in this cohort. This may be attributable to low dose or short follow-up. Repeating the study in subjects with established anorexia may be prudent in order to target an abnormal ghrelinergic response.
Irish Cancer Patients Value Nutrition But Lack Access to Appropriate Services

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Rationale: Weight loss (WL) and sarcopenia affect 12-71% of cancer patients, depending on cancer type. Anecdotal evidence suggests cancer patients have poor access to dietitians and use alternative diets, but these issues have not been studied nationally.

Methods: In September 2018, a survey was conducted to examine patient attitudes towards nutrition and access to dietetic services during their cancer journey. Patients diagnosed/treated in Ireland since 2015 were asked to complete a 25-item survey (online or in 24 hospitals nationwide).

Results: Of 1085 valid responses received (63% female, mean age 58yrs), all major cancers were represented & 33% had metastatic disease. Overall, 45% reported suffering from a diet-related problem and 44% and 52% reported weight or muscle loss since diagnosis, respectively. Amongst weight losers, 42% were ‘unhappy/worried’ while 27% reported being ‘delighted/happy’. Although 80% are ‘always/usually’ weighed in clinic, just 43% reported that they are ‘always/usually’ asked about diet. Nutrition was rated ‘very/extremely’ important by 89%. Only 39% received advice from dietitians and 57% of those without access to an RD would have liked more support with diet. While 58% reported trying general healthy eating, 38% and 32% tried an alternative dietary strategy or avoided a specific food due to their diagnosis, respectively.

Conclusion: While nutrition is highly important to Irish cancer patients, fewer than half surveyed had accessed a dietitian. Weight loss is common, but poorly understood by patients. A third used alternative dietary strategies, highlighting the need to screen patients for potentially restrictive diets to guide appropriate referrals.
Weight Loss and Systemic Inflammation Predict Survival in Advanced Cancer: Results of an International Prospective Study

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Rationale: To investigate predictors of survival in a cohort of patients with incurable cancer.

Methods: A prospective study of adult patients with advanced cancer was conducted across Ireland and the UK between 2012-2016. Patient demographics, performance status (ECOG), C-Reactive Protein (CRP) and nutritional parameters [BMI, % weight loss (WL), and body composition using computed tomography (CT)] were recorded. Sarcopenia and low muscle attenuation (MA) were defined using published cut-offs. Cancer Cachexia (CC) was defined using the consensus definition (2011). Cox models were used to estimate mortality hazard ratios, adjusted for known prognostic covariates.

Results: Of 1027 patients recruited (51% male, median age 66 years), 86% were on chemotherapy. Gastrointestinal cancer was most common (40%) and metastases were present in 87%. At baseline, 14% had a BMI <20kg/m² & 50% were overweight/obese. However, 33%, 45% & 52% had cachexia, sarcopenia & low MA, respectively. On multivariate analysis, only cancer site, ECOG-PS, WL>10%, CRP>5mg/L, and albumin<35g/L were associated with poorer survival. Lung and GI patients had poor survival compared to other tumour groups [HR: 1.769 (95%CI: 1.305–2.398), p<0.001 and HR: 1.576 (95%CI: 1.211–2.053), p=0.001, respectively]. WL>10% in 3 months and CRP>5mg/L were associated with reduced survival [HR: 2.01 (95%CI: 1.52–2.66), p<0.001; HR: 1.99 (95%CI: 1.42–2.80), p<0.001 respectively].

Conclusion: Independent predictors of survival in this cohort of advanced cancer patients were cancer site, ECOG, WL>10% and systemic inflammation, the latter two being important components of the cancer cachexia syndrome. Thus, early detection and management of CC may improve outcomes for patients undergoing palliative treatment for cancer.
High Incidence and Prevalence of Cancer-Related Weight Loss and Sarcopenia in the British Isles

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Rationale: Weight loss (WL) and sarcopenia are common in oncology populations and are associated with negative clinical outcomes including poor tolerance to treatment, decreased quality of life and reduced survival. The numbers of patients with cancer affected by sarcopenia and WL in Ireland and the UK are currently unknown.

Methods: A literature search was undertaken to identify the mean prevalence of WL >5% and CT-diagnosed sarcopenia in 9 cancer groups. Incidence and prevalence of each cancer were obtained from national cancer registries of the Republic of Ireland (ROI) and UK. Rates of WL >5% and sarcopenia in the population were extrapolated from these data.

Results: The 9 cancer groups with reported rates of WL >5% and sarcopenia accounted for 96% and 93% of ROI and UK incident and prevalent cases, respectively. We estimated that across the region, 128,892 cancer patients are affected by WL>5% annually and that 716,124 cancer survivors have suffered WL >5% during their disease trajectory. Furthermore, we estimate that there are 133,707 annual cases of cancer patients with sarcopenia in the region. We estimate that there are 771,589 cancer survivors alive who have been affected by sarcopenia during their disease trajectory.

Conclusions: This is the first report estimating the burden of WL and sarcopenia across the UK and Ireland. These figures are conservative estimates limited by gaps in the literature. Given the impact of malnutrition on cancer outcomes during treatment, urgent attention is required to address gaps in access to nutrition care available to cancer patients.
Weight Loss, Sarcopenia And Cachexia Are Highly Prevalent in Irish Cancer Patients

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Rationale: International studies show a high prevalence of malnutrition in oncology patients, which impairs tolerance to chemotherapy, decreases quality of life and reduces survival. Currently the prevalence of cachexia (CC), sarcopenia and weight loss (WL) in Irish patients with cancer has not been described.

Methods: A prospective study of adult ambulatory cancer patients undergoing chemotherapy between 2012-2016 was conducted. WL history was obtained and muscle mass was examined using computed tomography (CT) images. Sarcopenia and low muscle attenuation (MA) were defined using published cut-offs.

Results: Of 1011 patients recruited (56% male, mean age 62 years), 57% had stage IV disease. At baseline, BMI was <20 kg/m² in 9% & ≥25 kg/m² in 57%. However, 43%, 39% & 45% had CC, sarcopenia and low MA, respectively. Furthermore, 51%, 35% and 17% had experienced WL>2%, >5% & >10% in the preceding 6 months, respectively. Only WL>10% was more prevalent in those with incurable disease (21% vs 13%, p=0.001). Foregut cancers were most associated with wasting, with 62% and 52% experiencing CC and WL>5% in 6 months, respectively. Sarcopenia occurred in 33-45% depending on cancer site, highest in hepatobiliary/pancreatic cancers and lowest in gynaecologic cancers.

Conclusions: All cancers are associated with significant weight and muscle loss. As these conditions are associated with poor clinical outcomes, more research is urgently needed to identify an acceptable screening tool which can be widely used to identify those cancer patients with the greatest needs for nutrition support. Furthermore, effective strategies to manage cancer associated wasting are required.
Lipidomics Analysis of Plasma to Understand the Molecular Pathways Implicated in the Pathophysiology of Fetal Growth Restriction in the SCOPE Pregnancy Cohort

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Fetal growth restriction (FGR) is defined as impaired fetal growth compared with normal growth potential for the fetus. FGR is estimated to affect 10% of pregnancies and leads to short and long-term complications for the baby. This study aimed to gain further insight into the metabolic pathways involved in the pathophysiology of FGR, using plasma samples taken at 20 weeks’ gestation in the SCOPE pregnancy cohort in Cork.

Plasma samples were collected at 20 weeks’ gestation from women participating in the SCOPE study in Cork. Cases were women with severe FGR (customised birthweight ≤ 7.6th centile) matched to controls who had uncomplicated pregnancies. Data independent analysis was performed for all samples in untargeted positive and negative ion modes, using UPLC coupled with mass spectrometry (Synapt G2-S, Waters). Data was processed using Progenesis QI, features were ranked based on adjusted p-values from empirical Bayes analysis, and significant features (adjusted p-value <0.05) were database searched for identification, and a shortlist of lipids of interest are reported. A total of 1,955 lipids were significantly altered in FGR samples, and 22 out of 34 shortlisted lipids were glycerophospholipids (GPL); all except one were detected in higher levels in FGR group.

This study suggests higher levels of GPL may be associated with FGR pathophysiology. Further research is needed to confirm the identification of the differently expressed lipids and to validate these findings in independent samples.
Investigating knowledge of ASA PS Classification in the oral surgery department of Cork Dental Hospital

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Objectives To field test the current ASA PS classification inter-rater reliability amongst the oral surgery staff including nursing, student, postgraduate and consultant level.

Methods 10 hypothetical patient cases were circulated amongst the oral surgery department. Each member of staff was required to identify the ASA PS of each individual patient case ranging from ASA1-ASA4. The proformas were anonymised.

Results Gaps exist in practitioners understanding of the criteria for each ASA PS group especially distinguishing between ASA2 and ASA3

Conclusions There are severe limitations to the ASA PS classification which is arguably too firmly established as written in stone. A change in the use of this classification system as our ‘gold standard’ of preoperative assessment is warranted.
Sensitizing pancreatic cancer cells to Electrochemotherapy by modulating cell cycle

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Pancreatic cancer, an aggressive malignant neoplasm is also the 9th most common cancer in Ireland.¹,² Pancreatic cancer tumours are some of the most intrinsically drug resistant.³ Patient fitness plays key role in the treatment options available. The drug Gemcitabine (GEM) is often the only treatment available to patients. GEM is a nucleoside analogue which causes DNA chain termination during replication, ultimately resulting in cell cycle arrest. Electrochemotherapy (ECT) combines electroporation (EP) with chemotherapy drugs.⁴ EP is a highly efficient strategy for introducing hydrophilic drugs and biological molecules into the cell. Our work aims to maximise the effectiveness of electrochemotherapy via use of a prechemotherapy agent which functions as a cell cycle modulator. We hypothesize that this combination treatment will prove to be an asset in the treatment of pancreatic cancer. Here we present the initial stages in achieving this goal.


2. Annual report of National Cancer Registry in Ireland, 2018 www.ncri.ie


Assessment of differences in lifestyle factors and biological sex on cognition and inflammation in healthy older aged adults

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Low grade chronic inflammation is a common feature of ageing and has been linked to cognitive decline and the development of dementia and Alzheimer’s Disease. Dementia occurs more frequently in women, while men are at a greater risk for developing mild cognitive impairment. Increased levels of circulating and brain pro-inflammatory cytokines have been shown to drive the progression of cognitive decline during ageing, while certain lifestyle factors such as physical activity may reduce the risk of developing dementia in part because regular exercise exerts anti-inflammatory effects. In contrast, obesity is associated with increased risk for cognitive decline. However, it is currently unknown how these lifestyle factors influence pro-inflammatory cytokine expression during ageing, and if differences in biological sex exert an influence.

A cohort (n=30) of healthy male and female participants (aged 65-85) were recruited from waiting rooms in St. Finbarr’s hospital and retirement clubs based on medical history, current medication status and Montreal cognitive assessment scores. Cognitive function was assessed using the Cambridge Neuropsychological Test Automated Battery (CANTAB). Serum samples were taken for analysis of inflammatory cytokine levels (TNF)-α, (IL)-4, (IL)-6, (IL)-8, (IL)-10 and (IL)-1. Physical activity using the International Physical Activity Questionnaires (IPAQ) and body-mass index (BMI) was recorded. We will correlate cognitive function measures and levels of inflammatory cytokines with physical activity, BMI and further determine if there is a biological sex difference. Results will reveal whether certain lifestyle factors influence cytokine expression and cognitive function during ageing, and how biological sex may play a role.
Patients referred for arteriovenous fistula construction: a retrospective outcome analysis

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Objectives:

Haemodialysis vascular access modalities include central venous catheters, arteriovenous grafts, and arteriovenous fistulae (AVF). With lower rates of sepsis and re-interventions, AVF are preferred.

Methods:

The current study is a single centre retrospective review of all patients who underwent AVF creation over a 2-year period between 2015 to 2017. Additionally, data was collected from the kidney disease clinical patient management system to provide statistics on AVF use in Ireland.

Results:

At the time of the study, 39.3% of hemodialysis patients in Ireland were using an AVF for vascular access and regional use varied from 50% to 20% across Irish hemodialysis centers. At the study center, 192 AVFs were created and the population was 69.3% male (n=133), 30.7% female (n=59) with a mean (±SEM) age of 58.8±1.03 years. Diabetes had been previously diagnosed in 57 patients. 54% of the fistulae were brachiocephalic (n=103), 33% were radiocephalic (n=63), 4% were brachiobasilic (n=8). A post-operative thrill or continuous flow on Doppler was present in 99% of patients (n=190) and there was an 82.7% maturation rate (n=153). Complications occurred in 5.7% of procedures (n=11). The AVFs were suitable for hemodialysis needling in 69.9% of patients (n=114).

Conclusions:

The results suggest AVF outcomes at this center are consistent with reported statistics in the literature. Age, sex, and diabetic status of a patient may influence surgical planning to move proximally for AVF construction. This study also supports AVFs as the optimal vascular access modality due to low perioperative morbidity and complication frequency.
Prevalence of risk of obstructive sleep apnoea among patients with cardiac diseases in an Irish population

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Introduction: Obstructive Sleep Apnoea (OSA) is a commonly undiagnosed condition. Risk factors for OSA are obesity, hypertension and diabetes mellitus, which are shared with many cardiovascular diseases (CVD). OSA has many recognised cardiovascular complications. However, the prevalence of OSA in patients with cardiovascular disease is poorly documented.

Aim: The aim of this project is to find out the prevalence of patients with CVD with high risk for OSA, and to stratify into specific cardiac diseases, namely ischaemic heart disease, arrhythmia, valvular heart disease and congestive heart failure.

Method: This study was conducted in the Cardiovascular Outpatient Clinic in Mercy University Hospital, Cork, Ireland between September 2018 to March 2019. The Berlin Questionnaire was administered by a trained medical student to patients with cardiovascular diseases. Based on the patients’ responses, they are stratified into either high risk or low risk.

Results: In a study population of 150 patients, 118 were male and 32 were female. The mean age was 66.5 ± 12.7 years, and mean BMI was 27.0 ± 4.31 kg/m².

Based on the Berlin Questionnaire, 32% of the study population are classified as high risk.

Stratifying by type of heart disease, the percentage of high risk OSA is 42.4% for ischemic heart disease, 17.1% for arrhythmia, 20% for valvular heart disease, and 66.7% for congestive heart failure.

Conclusion: There is a significant proportion of patients with cardiovascular diseases who are also at high risk of OSA, and this would merit clinicians’ attention and assessment. More research is needed to look at the incidence, morbidity and mortality of OSA in this population.
Evolution of the Risk Factors of Head and Neck Squamous Cell Carcinoma

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Objectives

This study aims to explore the changing trends in the role of smoking, alcohol intake and human papillomavirus (HPV) as risk factors of head and neck squamous cell carcinoma (HNSCC) in an Irish population. Given the poor documentation of epidemiological trends of HNSCC in the country, this study will provide a baseline for future reference and research.

Methods

Retrospective cohort study using existing data from the South Infirmary-Victoria University Hospital (SIVUH), Cork. Data was collected on smoking, alcohol, and HPV status for 4 major primary sites – oral cavity, oropharynx, hypopharynx and larynx.

Results

A total of 1,015 new diagnoses of HNSCC were identified between 1996 and 2015. The number of new cases increased significantly during the study period. The proportion of patients with new HNSCC who are current smokers has fallen from 56% in 1996 to 42% in 2015, while the proportion of never and ex-smokers increased. Alcohol habits remained largely unchanged. In the oropharynx, 50% of SCCs tested were HPV-positive. The proportion of HPV-positive cases increased during the study period. Larynx had the highest proportion of heavy smokers, with 79% having a history of more than 20 pack years. 7% (n=66) of patients were both never smokers and never drinkers, 56% (n=37) of whom had oral cavity SCC.

Conclusion

An increasing proportion of new cases of HNSCC in never and ex-smokers was seen over the study period. This may partly reflect changes in smoking habits, and the increase in HPV-related SCC. Ex-smokers continue to be at risk of developing HNSCC.
Dental Hygiene Students’ Confidence in Managing Patients with Eating Disorders

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Objectives: To determine perceptions of final year undergraduate dental hygiene students at a teaching hospital regarding their training and management of patients who have eating disorders.

Methods: Following ethical approval, an anonymous online questionnaire was distributed to Final Year Dental Hygiene (FYDH) students (n=14) approaching the end of their studies.

Results: A response rate of 86% for FYDH (n=12) was achieved. The perceived confidence of students in managing ED patients varied widely. A number of respondents (34%) perceived inadequate training in relation to dental management of ED patients. Dental Hygiene students perceived a requirement for further training in relation to the medical management (75%), personality traits (67%) and psychological needs (75%) of those suffering from Eating Disorders. One FYDH reported personal management of an ED patient during their training.

83% of respondents felt further training was necessary to be able to suspect an ED. 75% of respondents were unaware of local support services available to ED patients, with 83% of respondents also unaware of the Eating Disorder Centre Cork (EDCC).

Conclusions: There is need for improvement within the current dental hygiene curriculum to improve education on eating disorder patients, specifically, their management by dental hygienists and their interaction with supporting services.
Early predictive markers for grade and seizures in neonatal encephalopathy

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BACKGROUND: One of the challenges we face today is early prediction of brain injury and risk of seizures after perinatal asphyxia. The aim of this study was to assess the ability of early markers to predict NE grade and seizures development.

METHODS: This was a secondary data analysis from two European multicentre cohort studies. Infants born >36 weeks gestational age (GA), with NE having EEG monitoring were included. All EEG recordings were assessed for grade of NE and presence of seizures. The early features used for the analysis were: GA, birth weight, intrapartum complications, Apgar at 1 and 5 minutes, lowest cord pH, post resuscitation pH, base deficit and lactate, most intensive level of resuscitation at birth. Predictive ability was examined using machine learning techniques.

RESULTS: 266 infants with NE were included, 46.2% with moderate NE, mean(SD) GA was 40.05±1.30 weeks, median Apgar scores were 2 and 4, at 1 and 5 minutes respectively, mean(SD) cord pH 7.03±0.19; 79.3% received therapeutic hypothermia, 34.2% had electrographic seizures. GA, Apgar at 5, most intensive resuscitation, first postnatal base deficit and lactate were combined to predict NE grade, with an overall accuracy of 54%. For seizures, the best prediction was obtained by combining Apgar score at 5 minutes and first postnatal lactate, with an overall accuracy of 76%.

CONCLUSION: This demonstrates that early features are not robust enough to predict encephalopathy grade and guide treatment but might raise an alarm for infants at risk of seizing. Additional predictive power requires additional physiological or biochemical biomarkers.
The Effect of Anxiety on a Patient’s Perception of Pain During Urodynamics in a Urogynaecology Setting

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Introduction: Urodynamic studies (UDS) are an important set of urological investigations which allows bladder function and physiology to be determined. Although UDS are generally well tolerated, moderate-to-severe discomfort during UDS is experienced by approximately 25-36.7% of patients. This study aims to determine the effect of anxiety on pain experienced by women undergoing UDS and assess overall tolerability of UDS in an Irish urogynaecology setting.

Methods: Survey-based prospective study of consecutive female patients undergoing outpatient UDS in Cork University Maternity Hospital (n=39). Exclusion criteria included prior experience of UDS or failure to complete the procedure.

Results: A wide range of pain scores and a low median pain score were reported (NRS: range= 0-7/10, median= 1.79/10; VDS: range= 0-3/5, median= 1.08/5). Increased patient anxiety was significantly correlated with pain experienced during UDS (NRS: Adjusted R² = 0.415, p<0.001; VDS: Adjusted R² = 0.09, p=0.004). The effect on procedural pain of depression scores, age and patient understanding of UDS was not significant. All patients indicated that they would be willing to undergo UDS again and would recommend UDS to a friend if it was medically indicated.

Conclusion: Overall UDS is well tolerated by patients. However, patients with increased anxiety levels perceive higher degrees of discomfort during the procedure. Age and patient understanding of the procedure are unsuitable methods for categorising patients into cohorts likely to experience pain during UDS. Identification of anxious patients could allow for the provision of interventions to mitigate the effects of anxiety on pain perception.
The effects of Mirena on the myometrial vascular bed in patients with menorrhagia

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INTRODUCTION: The Mirena intrauterine system (IUS) has greatly improved treatment options for women with menorrhagia. Although the effects of locally administered progesterone on the endometrium have been thoroughly investigated, its effects on the myometrium have not been explored.

AIMS: This study aims to quantify the vasculature of non-gravid myometrium and determine any morphological changes within the myometrial vascular bed after IUS exposure in patients with menorrhagia.

MATERIALS AND METHODS: Myometrial tissue was obtained from women with menorrhagia undergoing elective hysterectomy. Pilot study participants were divided into two study arms; patients with an IUS inserted 6-10 weeks prior to surgery (n=4), and patients never exposed to an IUS (n=4). Fluorescent and Masson’s Trichrome staining techniques were applied for light microscopy imaging. Stereological techniques were employed to provide unbiased estimations of tissue morphology. This study had full ethics committee approval.

RESULTS: This study measured a significant change in myometrial vasculature after exposure to IUS treatment. Patients given IUS treatment showed an increased radial diffusion distance per blood vessel (p<0.05), a trend towards decreased numbers of blood vessels per mm² (p=0.055) and decreased length density (p=0.055). We measured no change to the ratio of smooth muscle cells and extracellular matrix within the myometrium (p>0.05).

DISCUSSION: Overall, this pilot study has shown that locally administered progesterone causes alterations within the myometrium. This provides a novel insight into the effect of progesterone on myometrial vasculature and further study may lead to a better understanding of hormonal adenomyosis treatment and breakthrough bleeding.
THE RELATIONSHIPS BETWEEN OBESITY AND DEPRESSION IN MIDDLE-TO OLDER-AGED ADULTS IN IRELAND: A CROSS-SECTIONAL ANALYTICAL STUDY

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Obesity and depression are significant global healthcare burdens. Evidence suggests that an association exists between obesity and depression. However, there is limited documented evidence in Ireland. The aim of this study was two-fold: 1) to estimate prevalence of obesity/overweight among middle- to older-aged adults diagnosed with depression; 2) to assess relationships between obesity and depression, and to determine demographic and lifestyle factors that affect this association.

This was a cross-sectional analysis of the Mitchelstown Cohort Rescreen study of 2015, a random sample of 1,366 men and women aged 57–77 years recruited from primary care. Obesity was defined using recommended Body Mass Index classification. The presence of depression was based on participants’ self-reported diagnosis of depression, or a major depression diagnosis as validated by the Centre for Epidemiologic Studies Depression scale (CES-D). Logistic regression was used to determine relationships between obesity and depression adjusting for demographic and lifestyle factors available to the study.

32.2% of participants were obese; 36.5% of males and 27.7% of females. 14.2% of participants had depression; 13.4% of males and 15.1% of females. Obesity was found to be significantly associated with depression in multivariable analysis (OR = 1.7, 95% CI: 1.1, 2.7).

Approximately, one-in-seven middle- to older-aged men and women who were diagnosed as depressed were found to be overweight or obese. We cannot infer causal relationships in this cross-sectional study. However, our findings may have economic and public health consequences.
Neuroanatomy of the spinal pathways: Evaluation of an interactive multimedia e-learning resource

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In an era, where neurological diseases still account for 6% of global morbidity and mortality, we are witnessing a worrying diminished number of young doctors opting for specialty neurology training and a reduced confidence in managing neurology patients. Data suggests that health practitioners interlink difficulties in managing neurology patients with impaired understanding of neuroanatomy and associated clinical correlates. Owing to the limitation of traditional pedagogies, the targeted design of e-resources is instrumental in aiding medical students learn neuroanatomy. This study describes the design and evaluation of an interactive e-resource for the neuroanatomy of the spinal pathways based on cognitive theories of multimedia learning.

Using a single-blinded controlled experimental design, knowledge of the spinal pathways was assessed prior and after usage of the novel e-resource compared to control web-resource. Participants who did not use the allocated resource were placed in a separate group. The perceived usefulness of the tool used was gauged using Likert-scale questionnaires.

Results showed that while performance in the second assessment improved for all groups, the learning gain of participants in the experimental groups was higher compared to participants who did not use e-resources. The Likert-scale ratings revealed a significantly higher appreciation for the novel tool compared to the control tool when learning clinical correlates. Lastly, stronger correlations between the students’ perception of the tool used and their second assessment scores suggest that students favored the instructional design of the University College Cork e-tool. The e-resource shows promising results in bridging the gap between neuroanatomy knowledge and its clinical application.
AN EXPLORATION OF THE FEASIBILITY AND ACCEPTABILITY OF WEARABLE TECHNOLOGY IN PARKINSON’S DISEASE

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Background: Wearable technology is increasingly used to diagnose, monitor and manage neurological disorders such as Parkinson’s Disease (PD). This study aims to gain information about the views and needs of people with Parkinson’s (PwP’s) regarding wearable technology for monitoring the disease and assisting management.

Methods: The study employed a mixed methods parallel design, wherein focus-groups and questionnaires were concurrently conducted with PwP’s. Questionnaires and topic guides were developed together with PwP’s. Focus-group participants were purposively sampled for variation in PD stage, age (all >45 years) and sex. Questionnaire and focus-group results were analysed together, using a pragmatic triangulation protocol.

Results: Thirty-two questionnaires and four semi-structured focus-groups (n=24 participants) were completed. Participants were overall positive about wearable technology in PD, and perceived benefits for improved management of symptoms. Wearables should be user-friendly and demonstrate clinical usefulness. Comfort, cost and guidance were emphasised for greater usability. Sharing of information between PwP’s and health professionals for improved outcomes was highlighted. PwP’s perceived that patient data in the form of reliable information from wearables may allow for more accurate management of PD. Participants felt that wearables could help increase physical activity, and track compliance with medication. While participants anticipated possible challenges for some in wearing a device, they believed overall potential benefits outweigh these.

Conclusions: Engaging PwP’s in the design is vital for development of wearable devices that improve management of PD. This study will directly inform a multi-country feasibility study of wearable devices for older people, with a focus on the needs of PwP’s.
A Post-mortem Observational Study on an Anatomical Donor With Sporadic Inclusion Body Myositis

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Sporadic inclusion body myositis is a progressive muscle disorder that is characterized by muscle inflammation and degeneration. It is one of the distinctive categories of inflammatory myopathy, along with polymyositis and dermatomyositis. It is recognized as the most common severe form of idiopathic inflammatory myopathy that occurs in individuals who are over the age of 50 years. It has a distinctive pattern of selective muscle weakness and atrophy involving certain distal and proximal muscle groups. The aim of the study is to examine the histological and gross anatomical features of a post-mortem donor with sporadic inclusion body myositis and a healthy individual with no history of chronic condition as a control. Haematoxylin and eosin staining, as well as gross dissection techniques, were used. The histological findings highlight that the donor with sporadic inclusion body myositis had anatomical and histological abnormalities typical of the disease, including the muscles of the medial and anterior compartment of the lower limbs, as well as digital flexor muscles of the upper limbs. Measurement of muscle tendon length revealed dramatic changes in the morphology of the degenerating muscles with alteration in the proportion of muscle fibre length to tendon length. This is the first report of measurement of muscle to tendon ratio in inclusion body myositis as an indicator of muscle degeneration.
Stillbirth and risk factors: a quantitative content analysis of Irish and UK websites

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Introduction: Research indicates that the internet is used to source health related information, including pregnancy related information. The aim of this research was to examine the content of websites targeted at the pregnant population to assess the content in relation to stillbirth and maternal behaviours.

Methods: The study was limited to websites hosted in Ireland and the UK and organised by provider and topic. A data collection tool was designed to record the information found on the websites. Data were collected on different website characteristics, and searching general information related to stillbirth (prevalence, causes, procedures, consequences, etc.); and information relating to modifiable risk factors (smoking, alcohol/drug use, medicines use, sleep position, attendance at antenatal care, and weight management).

Results: 92 websites were included in the study of which 40.2% (n=37) contained information related to stillbirth and 29.3% (n=27) information related to behavioural risk factors. In total, only one website (1.1%) contained all the information searched for. Websites hosted by charities (n=28) were more likely to contain the searched information than any other provider (32.4%, n=12 for stillbirth general and 29.6%, n=8 for behavioural risk factors). Support for families was the most recurrent topic regardless of the provider.

Conclusion: The results of this study illustrate that websites directed at the pregnant population are a poor source for information related to stillbirth. These risk factors are modifiable; therefore, it is crucial that women and stakeholders can avail of reliable sources of information to make informed decisions.
Dietary intervention with polyphenols ameliorate maternal separation-induced depressive behaviours

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Depression is a neuropsychiatric disorder characterised by a negative impact on mood, and considered as a major health concern. Evidence suggests that early-life stress induces critical consequences for behaviour, which are associated with increased risk for developing depression in adulthood. The maternal separation (MS) model in rats is a robust paradigm to study the effects of early-life stress, which produces a consistent depressive phenotype in adult animals. Diversely, phytochemicals known as polyphenols have demonstrated potential in treating mood disorders, but their effects after early-life stress are unclear. Therefore, we investigated the effects of polyphenols in alleviating depressive behaviour in MS rats.

After MS procedure, adult male Sprague-Dawley rats underwent an 8-week intervention with polyphenol-enriched diets. MS rats showed increased depressive-like behaviour in the forced swim test compared to the non-separated (NS) control group, and increased anxiety in the open field test. Intriguingly, all polyphenolic treatments prevented these depressive-like behaviours.

MS is also associated with alterations in brain neurochemistry and homeostasis with the hypothalamic-pituitary-adrenal (HPA) axis, which are involved in the development of depressive behaviour. Therefore, we examined the effects of polyphenols on monoamine neurotransmitter levels, and corticosterone concentration in plasma. MS resulted in altered levels of 5-HIAA and dopamine, accompanied by abnormal elevation of corticosterone. Although polyphenols did not reverse neurotransmitter imbalance, xanthohumol normalised corticosterone levels in MS rats. These results suggest that polyphenol antidepressant effect could be partially mediated by HPA regulation. Currently, studies investigating the role that the gut microbiome plays in polyphenol-mediated antidepressant activity are ongoing.
A Structured Literature Review of Post-Diagnostic Processes and Pathways for People with Younger Onset Dementia

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Background: The term younger onset dementia (YOD) describes any form of dementia diagnosed in people under 65 years. In Ireland there are approx. 4,066 people with a diagnosis of YOD, with a projected 20% (4,887) increase expected by 2046. Post-diagnostic care is problematic for this group because many of the typical dementia supports may either be inappropriate or unavailable due to age restrictions. This study was commissioned by the National Dementia Office to support national decision-making on dementia services and pathways for Ireland.

Method: A structured literature review was conducted to identify optimum post-diagnostic care pathways for people with YOD (PwYOD). A systematic search strategy was devised. Databases searched included: Pubmed/Medline, PsychInfo, Cinahl, Embase, The Cochrane library, Lenus and Google Scholar, and grey literature sources. A narrative synthesis approach was used to assess and summarise the literature.

Results: Compared to later onset dementia, the literature on models of post-diagnostic support for PwYOD is sparse. Internationally, there is widespread variation in timely post-diagnostic support and interventions, with pathways remaining ad-hoc and unclear and PwYOD often experiencing great difficulty accessing personalized supports offered in a timely inclusive manner.

Conclusion: Timely post-diagnostic support can help PwYOD and their families adapt well to the multiple changes dementia presents yet, there is an absence of age-appropriate service models available for this vulnerable group of people. New models of service delivery need to be developed that are evidence-based, age appropriate, promote quality-of-life and focus on personalized supports of a group of people hugely neglected in Ireland and internationally.
Motivation and Learning Methods of Anatomy: Associations with Mental Well-being in a cohort of first year Speech and Language Therapy Students

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Appropriate anatomy education for speech and language therapists (SLT) is crucial for their clinical practice. While much research exists regarding the anatomical education of medical students, there is paucity of evidence in the field of anatomy education for SLT students. The specific areas addressed in this study were the methods employed by SLT students to learn anatomy, their perceptions of the clinical importance of anatomy, their motivation to learn anatomy and how this relates to potential barriers to motivation such as mental well-being. Twenty-four first year SLT students in University College Cork responded to Likert Questionnaires including a modified version of the motivation strategies for learning questionnaire (MSLQ) and the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS). Data analysis using Chi squared and Spearman correlation revealed that 92% of students agreed/strongly agreed that a sound knowledge of anatomy is important for their clinical practice. 74% agreed/strongly agreed that lectures were their primary learning modality and 91% of students agreed/strongly agreed that they worried a great deal about tests. This statement was also strongly negatively correlated with the numerous WEMWBS statements. The data have revealed that SLT students place importance on anatomy especially in their future clinical practice, that they have different preferences for learning anatomy compared to medical students, and that they have significant anxiety surrounding anatomy examinations. The fact that there are multiple significant correlations between responses to the motivation and mental well-being questionnaires suggests that there is a significant relationship between student motivation and well-being.
Non-Invasive Diabetes Risk Scores for Detecting High-Risk Patients in Clinical Practice

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Introduction: Type 2 diabetes is a significant cause of morbidity and mortality and previous research suggests that 41% of diabetes cases in Ireland’s middle-aged population are undiagnosed. Non-invasive risk scores have been developed with the aim of identifying patients with undiagnosed diabetes and may present a cost-effective method for screening on a large scale. However, currently no risk score has been validated in an Irish population. The aim of this study was to apply nine diabetes risk scores to an Irish dataset to determine which score is most appropriate for use in an Irish population.

Methods: This study was a secondary analysis of the Mitchelstown Cohort Study, a cross-sectional sample of 2,047 middle-aged men and women. Receiver operating characteristic curve analysis was used to assess the ability of diabetes risk scores and risk score components to discriminate prevalent type 2 diabetes cases.

Results: Among the examined scores, area under the curve (AUC) values ranged from 0.71–0.78, with the Cambridge Diabetes Risk Score (AUC=0.78, 95% CI: 0.75–0.82), Leicester Diabetes Risk Score (AUC=0.78, 95% CI: 0.75–0.82), Rotterdam Predictive Model 2 (AUC=0.78, 95% CI: 0.74–0.82) and the U.S. Diabetes Risk Score (AUC=0.78, 95% CI: 0.74–0.81) demonstrating the largest AUC values as continuous variables and at optimal cut-offs. Regarding individual risk score components, anthropometric measures displayed the largest AUC values.

Conclusion: The best performing scores were broadly similar in terms of the components included in the models; all incorporated variables for age, sex, BMI, hypertension and family history. The Cambridge model had the largest AUC value at an optimal cut-off, can be easily accessed online for use in a clinical setting and may be the most appropriate for use in an Irish population.
Neuronal Networks underlying Microbiota-Gut-Brain Communication

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In recent years, different lines of evidence have shown that the microbes inhabiting the gut can communicate with the brain. Alterations to, or the lack of gut bacteria, has been shown to affect molecular, anatomical and behavioural parameters, which have been linked to physiological and psychological disease. However, the mechanisms underlying these effects have not been identified thus far.

In this study we used targeted recombination in active populations (TRAP) to express mCherry in a subset of neurons activated by input coming from the vagus nerve. Both food and Cholecystokinin, which are known to stimulate the vagus nerve, resulted in mCherry expression in the nucleus tractus solitarius (NTS), the main projection area of gut-related vagal neurons. These results prompted us to investigate, whether gut bacteria could be using similar vagus nerve related pathways. Following administration of Lactobacillus reuteri we observed activation in gut-related subregions of the NTS and an overall much higher number of activated cells than in control mice. Therefore, we can conclude that Lactobacillus reuteri utilizes the vagus nerve to communicate with the brain. Further research is now needed to identify the target regions of activated neurons to fully decipher the networks that are involved in the beneficial effects of Lactobacillus reuteri administration on the brain.

Overall our results indicate the capability of TRAP to further investigate neuronal networks underlying vagus nerve related microbiota-gut-brain communication. It is our aim to extend this technology to understand the neuronal activation patterns and impact of live biotherapeutics on emotions and behaviour.
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Differences in cannabis use and subjective effects in an Irish third-level student population

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**Background:** There is evidence to suggest an association between frequent cannabis use and increased risk for psychiatric disorders. In this context, it is important to investigate motivation to use cannabis and reported subjective effects in frequent versus infrequent cannabis users.

**Aims/objectives:** To examine for differences in reasons for use based on exposure history, and also to investigate differences in reported acute subjective effects based on exposure history.

**Methods:** A questionnaire-based observational, cross sectional study was performed on student volunteers from University College Cork (UCC) and Cork Institute of Technology (CIT). The survey included the following validated instrument: the cannabis experience questionnaire-modified version and reason for use scale. Mann-Whitney U tests were used to compare differences across measures between current (usually smoking cannabis in the last year) versus infrequent cannabis users.

**Results:** Several different reason for use were more common in current (N=178) than infrequent (N=291) users: ‘easier to sleep’ (p < 0.001); ‘to relax’ (p <0.001); ‘because it’s fun’ (p < 0.001). However, social markers such as ‘to be part of group’ and ‘to be liked’ did not differ according to frequency of use. Current users were more likely to report use of cannabis resulted in ‘full of plans’ (p=0.003) and ‘not wanting to do anything’ (p=0.012) feelings than infrequent users.

**Conclusions:** Consistent with the instrumental drug use hypothesis, we report that current cannabis users were more likely to use it for its calming and sleep-facilitating effects, and to relieve tension.
User Perceptions for Wearable Technology in an Older Population: A Scoping Review

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Background: Wearable technology is a fast developing area. Often, the focus of research is on accuracy, not practicality, despite the fact that this greatly influences utility. This scoping review therefore explored the design and usability preferences of people for wearable technology for health monitoring.

Methods: A scoping review was conducted of literature evaluating user preferences for the design of wearable technology systems, for people aged >50 years, with good health or chronic diseases.

Results: A search of relevant databases yielded 628 potential studies (after duplicates removed). Following screening, 17 papers were included. The most commonly reported theme related to design and user interface (13 studies). Users wanted a small, unobtrusive, and light device which doesn’t snag on clothing or affect activities of daily living, yet has a readable and easy-to-use interface, which may prove challenging for designers! Users preferred to wear a device on the wrist and/or hip region, being considered less obtrusive and more discrete. Users were acceptable of technology, but wanted specific training or clear instructions. Less commonly reported parameters include issues with privacy and ownership of data (two studies); cost (two studies); reliability and accuracy (three studies); and clinical usefulness. Where considered, participants didn’t want to wear a device by night (two studies). Safety was not a theme in any study.

Conclusion: Overall, user needs seem to be rarely considered in the design of wearable technology for health monitoring. However, these studies do highlight important user concerns, which should be considered by technology designers and prescribers.
A comparison of in vitro clonogenic survival and MTT viability assays for determination of epigenetic drug cytotoxicity in drug resistant oesophageal squamous cell carcinoma.

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Oesophageal cancer is highly aggressive and is the 6th leading cause of cancer-related deaths worldwide. Surgery remains the best modality in terms of local control but outcomes following resection as well as chemotherapy remain unsatisfactory because of locoregional and distant failure. Thus, new strategies are essential and warranted to improve treatment options. Recent genome and whole exome sequencing has identified widespread epigenetic dysregulation in oesophageal cancer. Epigenetic changes are reversible and thus can be manipulated pharmacologically. To provide novel insights into new therapeutic strategies the aims of our study were twofold: (1) to investigate the cytotoxicity of epigenetic drugs in drug resistant oesophageal cancer, (2) to compare the utility of the MTT metabolic assay with the clonogenic survival assay which measures the proliferative capacity for several cell generations. The two in vitro assays were compared following epigenetic drug treatments from three different drug families: DNA methyltransferase inhibitors (DNMTi: azacytidine, decitabine, 5-fluoro-2’deoxycytidine, RG108, procaine hydrochloride, zebularine), histone deactylase inhibitors (HDACi; panobinostat, valproic acid, romidepsin, SAHA, santacruzamate A, RGFP966, belinostat), bromodomain and extra-terminal motif inhibitors (BETi; JQ1, OTX015, GSK1210151A and I-BET762). Dose-dependent cytotoxicity was observed with 50% DNMTi, 71.4% HDACi and 75% of BETi examined. Using Pearson’s correlation coefficient for the MTT IC50 values vs the clonogenic LD70 values we obtained a high correlation r value of 0.912 (p<0.01). The comparable results between the colorimetric MTT viability assay and the clonogenic survival assay suggests that the former assay may be more convenient and quick in evaluating the cytotoxic effects of epigenetic drugs.
Identification and characterisation of bacteriolytic enzymes targeting *Clostridium difficile*

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*Clostridium difficile*, a Gram-positive anaerobic spore-forming bacterium, has emerged as a leading cause of infectious diarrhoea in hospitalized patients. Since microbiome disruption caused by antibiotic treatment has been associated with *C. difficile* infections, alternative non-antibiotic effective therapies must be identified that with a specificity of action leave the normal microbiome of the gut intact. In recent years bacteriophage derived endolysins and their derivatives show promise as a novel class of antibacterial agents. These have number of advantages over antibiotics including their narrow spectrum host range, thus only eliminating the target bacteria, and the low level emergence of bacterial resistance. In this study, a total of five endolysin genes identified after *in silico* genome analysis of *C. difficile*, and a number of bacteriophages infecting *C. difficile*. The selected endolysin genes were synthesized, cloned, expressed and successfully purified for *in vitro* activity assays. All endolysins investigated were found to be active against *C. difficile*. Some recombinantly expressed catalytic domains of these enzymes displayed greater lytic activity compared to full length endolysin. These enzymes showed highest activity between pH 7.0 and 7.5. Our initial data suggests that these endolysins have potential as a new therapeutic for combating the growing healthcare problems associated with *C. difficile* infections.
A feasibility study to investigate the effects of procalcitonin testing on antibiotic prescribing in lower respiratory tract infections in an Irish University Hospital.

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Background: Diagnostic uncertainty and a high prevalence of viral infections contribute to inappropriate antimicrobial prescribing for the treatment of lower respiratory tract infections (LRTI). Procalcitonin (PCT) is a biomarker which has shown promise in safely reducing antimicrobial prescribing.

Methods: We conducted a prospective, observational, single centre, randomised, open-label feasibility study to investigate the effects of PCT testing on antimicrobial prescribing in patients admitted with a LRTI. 119 patients were recruited and randomised, 79 intervention patients had PCT measured along with standard care and 40 control patients received standard care only.

PCT levels were interpreted using an evidence-based algorithm.

Primary outcomes were: patient’s antimicrobial consumption, duration, and length of hospital stay.

Results: The addition of PCT testing led to a significant decrease in duration of antimicrobial prescriptions (Mean 6.8 vs 8.9 days) \( p=0.012 \) and decreased length of hospital stay (Mean 7.4 vs 10.5 days) \( p=0.003 \) but did not demonstrate a significant reduction in antimicrobial consumption.

PCT levels were low with a median and IQR of 0.075 \( \mu \)g/l (0.05-0.26). Overall algorithm compliance rate was 32%.

PCT levels were associated with shorter course lengths (<7 days), early IV to oral antibiotic switch(<4 days) and completion of antimicrobial courses prior to discharge.

Conclusion: The addition of PCT testing had a positive effect on reducing antimicrobial durations and length of hospital stay. With further experience with PCT testing, reserving use for the management of exacerbations of non-severe COPD, community acquired pneumonia and influenza we anticipate greater confidence in clinicians in the use of PCT to support antimicrobial prescribing decisions.
A Structured Literature Review of Diagnostic Processes and Pathways for People Living with Younger Onset Dementia.

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Background: Currently, 1 in 10 people diagnosed with dementia in Ireland are aged under 65. This figure figures (4000 people) is increasing, and important differences exist between the diagnosis of younger onset dementia (YOD) and later onset dementia (LOD). Diagnosing YOD can be especially challenging since presentation may be atypical and there is a lack of clinical ownership in this area.

Method: A structured literature review was conducted to identify optimum models of diagnostic processes for PwYOD. Two research questions were addressed: (i) what models for the diagnosis of PwYOD exist nationally/internationally, and what evidence supports these and (ii) what are the differences between diagnostic processes and pathways for YOD compared with LOD. A systematic search strategy was devised to identify relevant scientific papers. Key databases were used, supplemented by grey literature searches, and a narrative synthesis approach was applied.

Results: Pathways to the diagnosis in YOD are unclear and complex, and compared with LOD, diagnosis takes more time. PwYOD are more likely to have multiple referrals to different specialists, have their memory and cognitive complaints misattributed to other factors such as depression and experience longer delays in obtaining diagnosis.

Conclusion: Few evidence-based best-practice models or guidelines for diagnosis of YOD exist internationally. Increased awareness of YOD among all healthcare professionals is necessary. There is a need for improved linkages to be developed between Geriatric Medicine, Neurology, Psychiatry, and Primary Care services and in certain instances for suspected cases of YOD to be referred to neurology-led memory clinics.
In silico analysis of oral bacterial genomes related to caries

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The oral cavity is the second most diverse microbial environment in the human body after the gut. In this habitat, bacteria live in close contact and need to be able to react quickly to the harsh surrounding conditions. Disrupting the balance of these bacteria leads to oral infections, such as caries and periodontitis, and can also have other impacts on general health. Here we take advantage of the more than 1,500 genomes available within the expanded Human Oral Database to analyse bacterial genomes of species associated with tooth decay (Actinomyces, Bifidobacterium, Fusobacterium, Lactobacillus, Streptococcus and Veillonella) using different bioinformatic tools. Pan-genome analyses of the main species within each group were carried out using Roary and Anvi’o. Determination of the total number of genes in each genera and the identification of core gene clusters revealed the functional diversity of each species in the oral cavity. In addition, through an estimation of gene relationships and phylogenomic analysis we were able to gain a general perspective on gene similarity/dissimilarity among the different species and their potential horizontal transfer origin. Finally, the distribution of bacteriocins, antibiotic resistance genes and virulence factors among these genomes was analysed with a view to assessing the safety and therapeutic potential.
A process evaluation of a feasibility study of the introduction of procalcitonin testing in an Irish University Hospital.

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Introduction: Antimicrobial stewardship (AMS) interventions can occasionally lack sustainability so new interventions should include qualitative analysis such as a process evaluation (PE). Procalcitonin (PCT) is a biomarker which has been shown to support prescribing decisions and reduce antimicrobial use safely in patients with respiratory tract infections (RTIs).

Methods: A PE was conducted to accompany a feasibility study of the introduction of PCT testing in patients with RTIs to determine does the intervention work and if so how and why, and to explore the contextual influences on the intervention in the hospital setting. The PE consisted of semi-structured interviews of relevant stakeholders. The Consolidated Framework for Implementation Research (CFIR) was used to guide data collection, analysis, and interpretation.

Results: Analysis of the interviews identified three main themes.

(i) The PCT intervention and implementation process was viewed positively by participants who suggested modifications to improve implementation in a future trial.
(ii) AMS context included the concept of risk associated with infection treatment emerging as a barrier to implementation
(iii) The hospital context consisted of barriers such as available resources and facilitators including the hospital culture of quality improvement and communication.

Conclusion: Prompt availability of PCT levels as a point of care test would allow the results to be “more of a clinical influence” on prescribing. The CFIR was an effective framework to guide the PE and the exploration of the contextual influences on the intervention. The positive findings of this PE and feasibility study should be built upon and a full RCT should be considered.
Effect of Body Composition on Short-term Surgical Outcomes in Patients who have Undergone Adrenalectomy Surgery

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Background: Body Composition factors like low muscle mass or sarcopenia, high adiposity and high Body Mass Index (BMI) have been widely reported to be associated with poor treatment outcome, and decreased overall and disease free survival. Hence, this study aims to investigate the impact of body composition on short-term surgical complications in patients undergoing adrenalectomies.

Methods: A retrospective study was conducted on 59 patients who underwent an adrenalectomy in Cork University Hospital from 2008-2019. 27 patients with available scans and complete data were included. Using Computed Tomography (CT) scans at the level of L3, skeletal muscle area (cm²) and adipose tissue areas were mapped out to calculate Skeletal Muscle Index (SMI, cm²/m²), visceral, subcutaneous and total adipose tissue Index (VAT, SAT, TAT index, cm²/m²). Pre-defined cut-off values were utilised to determine sarcopenic status while medians were used as cut-offs for adiposity. Univariate logistic regression analyses were conducted to measure the association of sarcopenia, adiposity and other covariables for surgical outcomes.

Results: 9 (33.3%) out of 27 patients were sarcopenic. Sarcopenia was not significantly associated with surgical complications (OR=1.00, 95% CI=0.146-6.853, p=1.00). However, a higher VAT index (OR=1.060, 95% CI=0.898-0.990, p=0.019) and higher BMI (OR=1.248, 95% CI=0.648-0.991, p=0.041) were significantly associated with an increased risk of surgical complications.

Conclusion: Increased Adiposity and increased BMI are prognostic factors for short-term complications in patients undergoing adrenalectomies. Future studies with a larger sample size and of a prospective nature may be more useful in measuring the association between sarcopenia and post-adrenalectomy outcomes.
Characteristics of Patients Admitted to a Novel Community-based Stepdown Intermediate Care Unit – The St. Francis Unit, Cork City, Ireland

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Introduction: The St. Francis Unit(SFU) is a community-based stepdown intermediate-care-unit of the Mercy University Hospital(MUH) in Cork, which serves to allow transitional time for medically stable patients to regain functional independence prior to discharging home.

Aim: We aim to evaluate the patient characteristics of SFU and determine the patient demographics, unit-admission reasons, length of stay(LoS) and place of discharge.

Methods: A prospective cohort study was performed on the first 314 consecutive patients admitted to SFU between September-2016 to May-2017. Patients were included if they were admitted to MUH and no longer required acute-inpatient-care but not yet ready for home-discharge. Data were collected by the head-nurse, validated through weekly multidisciplinary-team meetings at SFU and analysed using SPSS with p<0.05 considered significant.

Results: Of 314 patients, 173(55%) were females and mean(sd)age was 79(9)years. 108(34%) patients were 70-79years, 145(46%) were 80-89years and 25(7%) were ≥90 years. Resolving infection was the commonest unit-admission reason at 134(43%), compared to 67(21%) gaining-mobility, 41(13%) postoperative recovery, 35(11%) neurological disorders, 34(11%) circulatory disorders, 10(3%) gastrointestinal disorders, 7(2%) respiratory disorders, 6(2%) soft-tissue infections. The mean LoS was 11.3(7.3)days: 92(29%) <7days, 129(41%) 8-14days, 45(14%) 15-21days, 6(2%) 22-28days, 9(3%) >28days. For place of discharge, there were 213(68%) home, 35(11%) MUH and 21(7%) long-term care. Age was positively correlated to infection(OR 1.04; 95%CI 1.01to1.06; p<0.013) but not LoS(OR -0.13; 95%CI -0.17to-0.14; p=0.83).

Conclusion: SFU patients were mostly elderly-females between 80-89years with infection as the commonest unit-admission reason and mean-LoS of 11 days. This research could help MUH clinicians to reassess their SFU admission criteria.
Cognitive impairment and Dementia in Parkinsonian Syndromes

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Introduction: As PD progresses, cognitive impairment develops in both iPD and aPD. The latter includes PSP, MSA, CBD. Deterioration of PDMCI to PDD affects daily independence. Although the MoCA is recommended for cognitive assessment, it is not routinely administered. Furthermore, the UPDRS, has only one cognitive self-report item. Thus, much PDMCI and PDD is undetected.

Aims: To describe the prevalence of PD-MCI and PDD in PD Syndromes.

Methods: A retrospective cohort study (n=152) of iPD and aPD patients aged ≥ 60 years-old, attending a geriatrician-provided Movement Disorder clinic, was performed. The prevalence and incidence of clicician diagnosed PD-MCI and PDD; scores and frequency of MoCA and UPDRS (total and motor sub-scores) were collected from chart reviews.

Results: Overall, there were 143 iPD and 9 aPD patients. Of which, 85 had or developed PDMCI (56%) and 37 had or developed PDD (24%) over a median follow-up of around 2 years. At first clinic review, a small number already had PDMCI (7 iPD and 1 aPD). PDMCI and PDD prevalence increased with time, with peak incidence of PDMCI and PDD in iPD being around 4 and 6 years from symptom onset respectively. At first clinic review, worse cognitive MoCA score, had a weak-moderate correlation with worse UPDRS motor score (p=0.012) and total score (p=0.014).

Conclusions: As PD progresses, patients develop PDMCI, and around ¼ developed PDD by a median of around 2 years since symptom onset. Cognitive scores are associated with PD motor scores, but not age. Regular cognitive assessment is warranted in elderly with PD.
Protective Lifestyle Behaviours and Cognitive Function in a Middle- to Older-Aged Population: A Cross-Sectional Analysis

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Background: Cognitive impairment among the elderly is an important concern and evidence suggests that certain lifestyle behaviours may have a protective effect against cognitive decline. In this study we examined the relationship between a 5-component protective behaviour score and cognitive function to determine whether the number of protective behaviours is related to cognitive decline.

Methods: This was a cross-sectional analysis of the Mitchelstown Cohort Rescreen study, a random sample of men and women aged 51–77 years. Cognitive function was assessed using the Mini Mental State Exam (MMSE). Cognitive impairment was classified as an upper 75th percentile reversed MMSE score value for the study sample. We defined 5 low-risk protective behaviours as never smoking, moderate alcohol intake, moderate to vigorous physical activity, a high-quality diet score (upper 40%) and a body mass index between 18.5 to 24.9 kg/m². Linear and logistic regression analyses were used to test associations between a protective behaviour score and the MMSE.

Results: A significant inverse association was observed between a protective behaviour score and the MMSE cognitive score ($\beta = -0.20$, 95% CI: -0.30, -0.10). Logistic regression suggested a dose-response relationship, with odds ratios of having poorer cognitive functioning being noticeably increased in subjects with 0 or 1 protective behaviours ($OR = 2.18$, 95% CI: 1.06, 4.52) when compared to participants with 4 or 5 in multivariable analysis.

Conclusions: These data imply that a combination of healthy lifestyle behaviours protects against cognitive impairment. As all of the examined factors are modifiable, small behavioural changes may help in preventing cognitive decline in an elderly population.
Protective Lifestyle Behaviours and Inflammageing: A Cross-Sectional Analysis of a Middle- to Older-Aged Population

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Background: Evidence has linked low-grade systemic inflammation with chronic diseases and evidence suggests that certain lifestyle behaviours may have a protective effect against systemic inflammation. In this research we examined relationships between a five-component protective behaviour score (PBS) and a range of 15 inflammatory markers to determine whether the number of protective behaviours is linearly related to biomarker concentrations and a more favourable inflammatory profile.

Methods: This was a cross-sectional analysis of 2,045 middle- to older-aged men and women. We defined five low-risk protective behaviours as never smoking, moderate alcohol intake, moderate to vigorous physical activity, a high-quality diet (upper 40%) and a normal body mass index (BMI) between 18.5 to 24.9 kg/m². Linear and logistic regression analyses were used to test individual protective behaviour and PBS associations with biomarker concentrations.

Results: The association between a PBS and each biomarker remained significant in adjusted linear regression analyses, with logistic regression models demonstrating that subjects with the fewest number of protective behaviours had 1.4–3.8 increased odds of having a less favourable inflammatory profile. In models which additionally adjusted for BMI, significant trend relationships were observed between the number of protective behaviours and biomarker levels.

Conclusions: These results suggest a cumulative protective effect of healthy lifestyle behaviours against systemic inflammation and that this relationship is independent of having a healthy body weight. As chronic low-grade inflammation which occurs in ageing may precede many non-communicable diseases, these data highlight the potential benefits of following a healthy lifestyle which may be of particular importance to older adults.
Protective Lifestyle Behaviours and Lipoprotein Particle Subclass Profiles in a Middle- to Older-Aged Population

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Background: Lipoprotein particle size is associated with increased risk for atherosclerosis and premature cardiovascular disease and studies also suggest that certain lifestyle behaviours may have a protective effect against chronic conditions. In this research we examined lipoprotein particle size and concentration relationships with a 5-component protective behaviour score (PBS) to determine whether the number of protective lifestyle behaviours is linearly related to lipoprotein subclasses and a more favourable metabolic profile.

Methods: This was a cross-sectional analysis of 2,045 middle- to older-aged men and women. Lipoprotein size, particle and subclass concentrations were determined using nuclear magnetic resonance (NMR) spectroscopy. We defined five low-risk protective behaviours as never smoking, moderate alcohol intake, moderate to vigorous physical activity, a high-quality diet (upper 40%) and a normal body mass index (BMI) between 18.5 to 24.9 kg/m². Linear and logistic regression analyses were used to test individual protective behaviour and PBS associations with lipoprotein subclasses.

Results: Among individual behaviours the association varied according to lipoprotein subclass, with normal BMI showing the most consistent relationship. The association between a PBS and lipoprotein subclasses remained significant in adjusted linear regression analyses for 13 of the 16 examined measures, with logistic regression models demonstrating that subjects with the fewest number of protective behaviours had 1.4–2.8 increased odds of having a less favourable metabolic profile.

Conclusions: These results suggest a cumulative protective effect of healthy lifestyle behaviours against a less favourable lipoprotein profile highlighting the potential benefits of following a healthy lifestyle, in particular, weight loss. Further research examining relationships between protective behaviours and markers of health is warranted.
BMI Perception: A new means of accurately measuring overweight and obesity?

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Background: Accurately measuring BMI in large epidemiological studies is problematic as objective measurements are expensive, so subjective methodologies must usually suffice. The purpose of this study was to explore a new subjective method of measuring BMI, BMI perception.

Methods: This was a cross-sectional analysis of a random sample of 1,354 men and women. Height/weight were measured according to standard procedures. BMI perception was measured by asking “Do you think you are underweight, normal weight, overweight or obese?” Patterns of reporting bias were determined by cross-classifying objectively measured BMI categories with self-reported BMI perception. Logistic regression was used to determine factors associated with correct BMI classification.

Results: A majority of overweight/obese participants underestimated their BMI. In multivariable analysis, gender and education were significantly associated with correct BMI perception. Additionally, participants who had been told by a health professional to lose weight or who were on a diet were more likely to correctly perceive their BMI. There was a linear trend relationship between increasing BMI levels and correct BMI perception; participants in the highest BMI quartile had approximate eight-fold increased odds of correctly perceiving their BMI when compared to subjects within lower overweight/obese quartiles (OR=7.72, 95% CI: 4.59, 12.98).

Conclusions: BMI perception as a subjective measurement of BMI has the potential to be an important measurement tool but further studies utilising self-reported weight/height as a measurement tool for comparison are needed. Clinicians need to be aware of disparities between BMI perception at the higher and lower BMI levels among overweight/obese patients and encourage preventative action for those at lower levels to avoid weight gain.
Determinants of patterns of cannabis use, abuse and dependence: Evidence from two national surveys in Ireland

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Background: Recent Irish data indicate that among people who have used cannabis within the last year, 30.3% meet the criteria for cannabis abuse and 19.7% are cannabis dependent. Knowledge of factors relating to patterns of cannabis use is important for informing drug policy. This study determined factors associated with recent and current cannabis use. In particular, we explored factors related to problematic use among current cannabis users.

Methods: We analysed data from Ireland’s 2010/11 and 2014/15 Drug Prevalence Surveys, which recruited 5,134 and 7,005 individuals aged 15+ years living in private households. Multinomial logistic regression was used to identify factors associated with recent and current cannabis use compared to experiential use. Binary logistic regression was used to determine factors related to cannabis abuse or dependence among current users.

Results: The weighted prevalence of experiential cannabis use was 18.3%, with 3.0% and 3.3% of participants indicating recent or current use respectively; 41.3% of current users indicated problematic use defined using DSM-IV criteria. In multivariable analysis, factors associated with recent or current cannabis use included being male, younger age, marital status and education. Among current users, factors associated with problematic use included being male (OR=1.77), younger age (OR=2.06), being single/never married (OR=1.87), lower educational levels (OR=4.15), being unemployed (OR=2.29) and type of cannabis used [skunk/weed] (OR=1.96), with sex, age, education, employment and cannabis type remaining significant in multivariable analysis.

Conclusions: Males, adolescents/young adults and socioeconomically deprived individuals are at a greater risk of having higher rates of cannabis use and of having problematic use. Health professionals should be aware of these factors to improve detection and prevention of cannabis use disorders.
A point prevalence survey of medication allergy documentation on a renal ward

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Introduction: Documentation of medication allergy is essential for patient safety. Inaccurate documentation compromises patient care by introducing the risk of medication reactions or needlessly reducing therapeutic options. In the case of antimicrobials, consequences include suboptimal antimicrobial therapy and increased broad-spectrum antibiotic use.

Aims: To investigate the prevalence of medication allergy documentation, types of recorded allergies and the concordance across medication kardexes, medical and nursing notes.

Methods: A point prevalence study was conducted of all inpatients on a renal ward in Beaumont Hospital, Dublin. Data was collected from medication kardexes, medical and nursing records. The data collected included patient demographics and medication allergy documentation (medication name and allergy type). Data from each source was then compared to identify concordance across the records.

Results: The majority of medication kardexes had a documented allergy status. Documentation levels were lower in nursing and medical notes. Concordance of documented allergies across the three sources was low, with noted discrepancies and omissions. Antimicrobials were the most frequently reported medications cited as causing an allergic reaction, with penicillin the most common. Documentation of the reaction type was seldom recorded across all medication groups.

Conclusions: The medication allergy section was completed in the majority of kardexes. However, documentation in other patient records requires improvement. Antimicrobials were the most common medication with documented medication allergies, though documentation of reaction type was poor. In an era of increasing antimicrobial resistance, this has implications for empiric antimicrobial choice, especially in the case of penicillin reactions, that needs to be addressed.
How do different treatment schedules affect patients’ lymphocyte counts during breast cancer chemotherapy?

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Lymphopenia is a recognized complication of chemotherapy and may be associated with opportunistic infections such as Pneumocystis jiroveceii pneumonia and fungal infections. Breast cancer chemotherapy regimens have become more intensive in recent years, with increased use of dose-dense (biweekly) and weekly Paclitaxel regimens potentially putting patients at increased risk of lymphopenia and infection. This study aimed to determine the extent of lymphopenia within three Paclitaxel-containing breast cancer chemotherapy regimens. Clinical and laboratory data for eligible patients (n=121) was collected and mean lymphocyte changes were compared between three treatment schedules then further divided into two groups based on Paclitaxel timing (weekly versus dose-dense).

The majority of patients (55.4%) displayed clinically significant lymphopenia at the end of treatment. The change in mean lymphocyte counts during treatment varied significantly between regimens (p<0.05), with the largest difference seen with a dose-dense Adriamycin/Cyclophosphamide and weekly Paclitaxel schedule (Δmean = -0.96, SD=0.50, p<0.05). Focusing on the Paclitaxel phase of the treatment regimens, patients receiving a weekly schedule had a mean decrease in lymphocyte count whereas those receiving treatment every 2 to 3 weeks had a mean increase (Δmean = -0.092 vs +0.097, p<0.05).

This study highlights that chemotherapy drugs, when used alone, in combination, or at different dosages, affect the immune capacity of the patient during their treatment. Despite significant increases in lymphopenia as documented in our study, routine prophylaxis against opportunistic infections is currently not used in adjuvant breast cancer regimens. Assessment of rates of opportunistic infections with various chemotherapy regimens would be of great benefit in future studies.
Developmental regulation of toll-like receptors and key accessory proteins in Sprague Dawley neonatal rats

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Premature infants are at increased risk of early life infection as a result of their immaturity and their prolonged hospital stays. Gram positive bacteria are a common source of late onset infection but there remains a paucity of information on the interaction of gram-positive proteins such as lipoteichoic acid and peptidoglycan with tissues important for cardiorespiratory control. Systemic inflammation is mediated by the activation of toll-like receptors (TLRs), which are major components found in many different cell types, ranging from epithelial to immunocompetent cells of the innate immune system. TLRs recognize the conserved molecular structures of pathogens upon bacterial infection. We sought to explore the developmental expression of pattern recognition receptors and key accessory proteins. We hypothesise that expression of pattern recognition receptors for Gram-positive bacteria are expressed in an age and sex-specific manner across multiple tissues important in cardiorespiratory control. Sternohyoid, diaphragm, spleen, adrenal glands, brainstem and spinal cord was harvested from male and female Sprague Dawley rat pups at postnatal day 3 and 13. Tissue was snap frozen and analysed using RT-PCR to examine gene expression of TLR4, TLR2, nucleotide-binding oligomerization domain-containing protein 2 (NOD2) and cluster of differentiation 14 (CD14) which are involved in immune response. Exploring immune responses during early life will contribute to understanding the vulnerability and resilience developed in preterm babies.
The Experience and Provision of Support for Men following their Partner’s First Trimester Recurrent Miscarriage. An Action Research Project

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Background: Miscarriage occurs in up to one in four pregnancies. The impact of miscarriage on men has not been adequately explored and is underpopulated in literature. Furthermore, there is a lack of research into men’s experience of recurrent miscarriage along with associated supports.

Problem Description: A lack of understanding about the lived experiences of men whose partners had first trimester recurrent miscarriage. Specific gaps in knowledge about support services available to them along with a need to put specific supports in place for these men.

Methods: Phases of action research were utilised inclusive of pre-planning, construction and planning action.

Process: Semi structured face-to-face interviews were conducted with five men. The men were recruited through a pregnancy loss clinic based in a maternity hospital. Interviews were transcribed and thematic analysis of the data was conducted.

Results: Themes: News of the first pregnancy was associated with immediate positive projection. Viewing of the ultrasound scan evoked a deeper connective and protective response. Men felt their role was that of protector for their partners. Men felt isolated and unimportant within the hospital setting. Men felt there was a lack of information regarding the actual miscarriage. They felt frustration with how the service is run.

Conclusions: The knowledge generated was critical in terms of improving understanding of men’s experiences. Accounts indicate that men report many ramifications resulting from first trimester recurrent miscarriage and furthermore men identify experiences that diminish their sense of support. This cohort of men need relevant support.
Has there been a reduction in codeine-related intentional drug overdose presentations to Irish hospitals following national guidance in 2010?

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Introduction: In Ireland, the most common method of hospital-presenting self-harm is intentional drug overdose (IDO). Concerns about the misuse of codeine products led to the introduction of guidance for pharmacists in 2010, restricting the supply of over-the-counter (OTC) codeine-containing products.

Aim: To examine the use of codeine-related IDO presentations to Emergency Departments before and after the introduction of guidance by the Pharmaceutical Society of Ireland in 2010.

Methods: IDO presentations to Emergency Departments, recorded by the National Self-Harm Registry Ireland between 1st January 2007 and 31st December 2013 were analysed. Event-based rates per 100,000 were calculated using national population data. Poisson regression models were used to assess rate changes between pre- and post-guidance periods.

Results: Between January 2007 and December 2013, a total of 57,759 IDOs were recorded, with 4,789 (8.3%) involving a codeine product. The rate of codeine-related IDOs was 21% lower in the period following implementation of the guidance (17.1 vs 13.5 per 100,000; IRR=0.79; 95% CI:0.74-0.84). The rate of all IDOs decreased by 6% in the same period (IRR=0.94; 95% CI:0.93-0.96). More pronounced reductions were seen in females when compared to males (25% vs 14%).

Conclusion: Our findings indicate that the guidance was associated with a reduction in the rate of codeine-related IDOs. They provide evidence supporting restriction of potentially harmful medication as an effective strategy in suicide prevention. However, as overall rates of IDOs also fell during this period, the reductions may not be fully attributed to the guidance.
Impact of maternal anemia during pregnancy on neurodevelopmental outcomes of children at 5 years in the Cork BASELINE Birth Cohort Study

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Introduction: Iron deficiency is the most common cause of anemia in pregnancy and has been associated with negative neurodevelopmental outcomes in children.

Objective: To assess the impact of maternal anemia during pregnancy on neurodevelopmental outcomes at 5 years of age.

Methods: This is a secondary analysis of participants from the prospective BASELINE Birth Cohort Study. Maternal anemia was determined using the booking visit hemoglobin (n 1184). Neurodevelopmental outcome at 5 years was assessed using the Child Behaviour Checklist (CBCL) and Kaufman Brief Intelligence Test (KBIT-2). Participants with both a maternal hemoglobin and a completed CBCL (n 867) or KBIT-2 (n 797) were included.

Independent t-tests were conducted, and univariate and multivariate adjusted linear regression models were used to estimate the effect of maternal anemia on test scores.

Results: The CBCL and KBIT-2 scores were analyzed based on the presence or absence of maternal anemia (Hb <110 g/L). There was a significant difference between the mean KBIT-2 nonverbal scores in the anemic (93.38, SD 3.5) v. nonanemic (99.77, SD 9.1) group (p = 0.048, 95% CI 0.05, 12.8). This association remained robust after adjustment for potential confounding factors (β = 6.2, 95% CI 0.091, 12.3, p = 0.047).

Conclusion: Maternal anemia during pregnancy has a negative impact on the nonverbal components of neurodevelopment, including fluid reasoning and visual processing, at 5 years of age. Further research investigating this relationship in populations with a higher incidence of maternal anemia and to determine whether it persists into later stages of life is required.
Irish patients with psoriasis have poor awareness of their risk of coronary artery disease and inflammatory bowel disease

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Psoriasis can profoundly impair quality of life. Improved health care outcomes are associated with patients having a clear understanding of their disease and its associated co-morbidities.

A validated questionnaire (Patient Awareness in Psoriasis) was used to assess patient knowledge of (i) aetiology, (ii) factors affecting clinical outcome, and (iii) co-morbidities. A scoring system (out of 100) was used to assess knowledge of each domain. Demographic details, past medical history and current and previous treatments were also recorded.

142 patients attending Biologic or General Dermatology clinics completed the surveys. The mean age was 50.1 years (range 17-85). 51.1% were female. 95.7% were Irish. 64.7% had finished education at secondary level. The mean time since initial diagnosis of psoriasis was 23.3 years (range 0-56). 85.8% patients were currently on biologic or systemic therapy.

Knowledge of the aetiology of psoriasis, and of factors affecting disease activity, was good with a mean score of 73.6% and 72.1% respectively. Knowledge of co-morbidities was poor at 42.9%. Only 17.7% of patients knew of the increased risk of coronary artery disease (CAD), and only 15% were aware of the association with inflammatory bowel disease.

71% of patients self-reported as ‘quite well informed’ on treatments for psoriasis. 49% self-reported as ‘quite well informed’ on co-morbidities.

This study demonstrates poor awareness of co-morbidities associated with psoriasis, such as CAD, among Irish patients. Improved clinical outcomes and a reduction in co-morbid risk may be achieved through improved health care literacy.
Effects of sugar substitutes on microbiome modulation and glucose homeostasis

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Unhealthy diet is the leading cause of ill health in the WHO European Region, linked to Noncommunicable Diseases, which account for nearly 90% of deaths in Europe. The human gut microbiome, the collection of microorganisms living in our intestines, has been implicated in a wide array of health processes and diseases. Sugar substitutes have been used as a dietary strategy for diabetes management; however recent studies have indicated that non-caloric artificial sweeteners (NAS) can promote metabolic disturbances, such as glucose intolerance, via interactions with the gut microbiome. These disturbances have been linked to sweetener-modulated changes in the composition of the microbiome including under representation of probiotic strains. Non-artificial sweeteners, such as rare sugars, allulose and tagatose (isomers of fructose), have been proposed as healthier alternatives for sugar-containing products. We hypothesize that these rare sugars could have less deleterious metabolic effects than fructose or NAS in combination with high fat high sugar (HFHS) diet. We aim to evaluate the effects of allulose and tagatose (isomers of fructose) on the gut microbiome and glycaemic control processes, as well as examine possible implications for rodent social behaviour, anxiety-like behaviour, and depressive-like behaviour. C57BL/6 mice were provided a HFHS fat diet for 12 weeks, and received fructose, NAS, allulose and tagatose in the drinking water, and the impact on energy balance-related parameters and the interactions with microbiome were investigated.
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Neo-adjuvant Combination BRAF/MEK Inhibition in Metastatic Melanoma prior to Lymph Node Dissection

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Combination dabrafenib, a BRAF inhibitor, and trametinib, a MEK inhibitor, has improved outcomes in metastatic melanoma with BRAF-V600 mutations\textsuperscript{1}. Three patients are presented who received combination therapy prior to lymph node dissection (LND) due to surgical issues.

A 47 year old woman had a malignant melanoma (MM) excised from her right lower limb. Three years later right inguinal biopsy showed BRAF-V600 positive MM. In light of excess adiposity, combination therapy was initiated. Recurrent pyrexia and cutaneous effects necessitated discontinuation after six months. A right groin LND was performed showing one 4cm lymph node replaced by melanoma.

A 43 year old man had a MM excised from his left back. Eight years later left axillary biopsy showed BRAF-V600 positive MM. He had a history of ischaemic heart disease and cardiomyopathy, so combination therapy was initiated. After six months, the node rapidly increased in size. Combination therapy was stopped and axillary LND was performed. Four nodes were positive for metastatic melanoma.

A 43 year old man had a MM excised from his abdomen. Seven years later left inguinal biopsy showed BRAF-V600 positive MM. PET/CT detected an enlarged para-aortic node. Due to the difficulty accessing the para-aortic node, combination therapy was initiated. Repeat CT showed resolution of the para-aortic adenopathy. After six months of combination therapy, a left groin LND was performed. One lymph node showed regressive melanoma.

Neoadjuvant therapy with BRAF/MEK inhibition may benefit selected patients with metastatic melanoma to optimise surgical outcomes.
The Perspectives of Asylum Seekers When Accessing Sexual Health Services in Cork and Kerry

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Background: The World Health Organisation states that; “Sexual health is a state of physical, mental and social well-being in relation to sexuality. It requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence.” Asylum seekers are among many vulnerable groups that face inequalities in terms of sexual health and how sexual health services are accessed. The aim of this study is to gain an understanding of the lived experiences of asylum seekers when accessing sexual health services in Cork and Kerry, including the perceived barriers to and factors that facilitate access.

Methods: This is a qualitative study which utilised data from 14 semi-structured interviews conducted with asylum seekers between May and June 2019. Participants were over 18 and living in direct provision in Cork or Kerry. This study used a content analysis to interpret the data and develop categories which produced the results.

Results: Participants demonstrated varying levels of understanding of sexual health and sexual health services. Several barriers and facilitators were identified which can be grouped into socioeconomic, political/legal, systemic, and social/cultural/religious barriers and facilitators.

Conclusion: The findings from this study highlighted several areas for improvement in the provision of information and services relating to sexual health for asylum seekers and revealed the importance of addressing these issues to fulfil the purpose of public health by promoting health, preventing disease and prolonging life for all members of society.
Strategies for Enhancing Medical Student Resilience: A Group Concept Mapping Study

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Introduction: Medical students are faced with constant stressors throughout their degree. A need exists to explore the resilience strategies medical students employ to address these demands. Insight into these specific strategies may guide potential adaptation and incorporation of resilience-promoting interventions into the medical curriculum.

Objective

- To investigate the resilience strategies employed by medical students in UCC to inoculate themselves against the deleterious effects of stress on their health and wellbeing.
- To explore the effectiveness of these strategies and determine which are important and amenable for inclusion into a resilience-based training programme within the medical curricula.

Method: Group concept mapping was utilised incorporating qualitative and quantitative methodologies. A stratified sample of 3⁰year DEM and 2⁰year GEM medical students attending UCC were invited to take part in the GCM process on the group concept software. The data was analysed utilizing The Concept System® software through multidimensional scaling (MDS) and hierarchical clustering.

Result: 6 resilience strategy categories emerged organically from the data based on students coding of the text into perceived similarities. These categories included ‘friends and family’, ‘de-stress through exercise/sport’, ‘extra-curricular non-medical activities’, ‘self-enabled distraction’, ‘organisation’, ‘caring for mental wellbeing’. Students rated the strategies. The ‘friends and family’ category rated the highest among students in terms of effectiveness whereas the ‘de-stress through sport and exercise’ category rated the highest in value of importance to incorporate into a resilience-based intervention programme.

Conclusion: Resilience strategies rated by medical students are accessible and amenable for implementation into the medical curriculum.
An Assessment of Inhaler Technique and Adherence in an Irish Cystic Fibrosis Centre.

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Introduction: The prevalence of concomitant asthma in CF has been estimated at 14-19%. There is little information available on CF patients’ inhaler technique and adherence, making it difficult to determine the true effectiveness of inhaled medications in CF.

Methods: In this cross-sectional study, clinical information was collected through a chart review of 173 CF patients attending Cork University Hospital. Inhaler technique and adherence were assessed in a subset of patients using validated technique scoring sheets and validated self-reported adherence questionnaire.

Results: 59.5% were male. The mean age was 31.11 years. 50.9% were homozygous for the ΔF508 mutation.

34.9% with a total IgE level recorded within the preceding 12 months had an elevated measurement documented. Reversibility was documented in 13.9% of available patient PFT results.

64.1% were prescribed a Short-Acting B2-Agonist, of which 43.2% were prescribed as part of an inhaled antibiotic regimen. 52% were prescribed an ICS/Long-Acting B2-Agonist combination. 15% were prescribed a Long-Acting Anti-Cholinergic.

96.8% previously received education on inhaler technique. 83.3% of patients demonstrated suboptimal technique (score<100%), the mean total score being 74.2%. Patients scored worst in the “Additional Steps” category (mean=59.4%).

70.3% reported adherence rates of 81%-100%. The most common barrier to adherence was remembering to take a dose (29.4%).

Conclusion: Analyses of total IgE levels and PFT results suggest a prevalence of the asthmatic phenotype of 13.9-34.9%, which is higher than in previous studies. 7 different inhalers were prescribed. Remembering to take doses and the “Additional Steps” category were identified as key barriers to inhaler adherence and technique. Future focus on these barriers may prove useful.
Autonomic Nervous System Function in Dementia Caregivers

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Background: Ireland has a growing population of people living with dementia and people who are dementia caregivers. Numerous studies highlight that caregiving can be viewed as a chronic stress exposure that may promote a state of chronic low-grade inflammation in circulating inflammatory markers as well as aberrant stress physiology. Previous evidence has indicated stress-related disorders like depression and anxiety are associated with altered heart rate variability, suggesting altered autonomic nervous system (ANS) activity.

Aim: This study aimed to investigate the effects of chronic stress on dementia caregivers’ ANS function.

Method: A cross sectional study of dementia caregivers in Cork was conducted where caregivers were recruited and compared to a non-caregiving healthy control population with longitudinal follow up of the caregivers. Participants provided saliva samples that were collected at four time points in the morning to assess waking levels of saliva alpha amylase (sAA) using the sAA kinetic enzyme assay kit. Data was collected from 50 dementia caregivers and 36 matched controls.

Results: There was a statistically significant increase in awakening sAA level concentrations (p <0.01) between dementia caregivers’ and controls’, indicating increased sympathetic ANS activation. A preliminary analysis revealed no significant differences (p>0.999) in sAA levels between Visit 1 and Visit 2 of dementia caregivers, indicating persistently increased ANS activation due to caregiver stress.

Conclusion: Dementia caregivers consistently have higher sAA levels than controls. Future studies need to explore the nature of this ANS dysfunction and determine if stress reducing interventions will improve caregivers’ sAA levels.
The development of a minimum dataset for a national diabetes registry in Ireland

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Background: The prevalence of diabetes is increasing in Ireland with an increase of 2.2% to 5.2% in doctor-diagnosed diabetes between 1998-2015. However, data to assess trends in diabetic complications are scarce. A disease registry is essential to support chronic disease management. Our aim was to conduct an e-Delphi consensus study to identify patient variables for inclusion in a minimum dataset (MDS) which will inform the development of a national diabetes registry.

Methods: Potential patient variables were identified from existing databases, including the National Diabetic Retinal Screening Register and the agreed dataset for the chronic disease management programme in the updated GP contract. We generated a list of 42 variables from these collated databases. We administered surveys to 10 experts from the National Diabetes Registry Advisory Group. Participants ranked patient variables from 1-9; 1 being least important and 9 being critically important. Variables ranked 7-9 by >70% of participants were included in MDS. Conversely, variables ranked 1-3 by >70% were excluded from MDS. Remaining variables will be included in survey-2. Survey-2 participants will receive information on total mean rating for each variable.

Results: Results from round-1 of the survey suggest that of the 42 variables, 22 will be included in MDS with 1 excluded. The remaining 19 for which consensus was not achieved will be retained for round-2. Round-3 may be undertaken if needed.

Conclusion: The MDS will be compiled using the variables for which consensus has been achieved and that the advisory group deems necessary for inclusion in MDS.
Immune phageome profiling of the human gut.

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**Background:** The humoral immune system represents a historical record of immune exposure. Immunoglobulin classes G (IgG) and A (IgA) comprise the dominant circulating and mucosal immunoglobulins. Enteric viruses have been shown to elicit humoral immune response and have become an increasing focus of microbiome research. Phage are likely fundamental in shaping complex microbial communities in the gut. The main aim of the study is to investigate whether specific components of the phageome in individuals with healthy and inflamed gut consistently generate IgG and IgA based anti-phage response. The differential IgA and IgG responses may enlighten separate activation mechanisms within the gut-immune axis.

**Methods:** Following isolation of the virome fraction from faecal samples from healthy (n=8) and diseased (n=12) individuals with cesium-chloride gradient purification, we used magnetic beads with IgG-binding domains to viruses under varying conditions. Shotgun metagenomic sequencing was performed on the Illumina MiSeq platform. Using an in-house bioinformatics pipeline, contigs or putative viral genomes, were assembled with the metaSPAdes assembler. Contigs below 1000bp were excluded and positively selected using various tools. vContact2 was used for further analysis.

**Results:** 7,297 putative viral genomes were identified after filtering and positively selecting the contigs. A reduction in the quantity of read sequences was observed from samples isolated with IgA compared to samples retrieved without IgA. Cohort clustering has been observed, but with insignificant overlapping between cohorts.

**Conclusion:** This study demonstrates that gut phageome constantly generate IgG and IgA response. The differential immune responses may enlighten separate activation mechanisms within the gut-immune axis.
Clinical Audit: Formal Family Meetings at a specialist palliative care inpatient unit

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Background: Family meetings can be a useful tool in medical settings; they can be an invaluable source of information and allow for clear communication between patients, families and medical staff. Formal meetings require planning, time and resources from everyone involved. It is vital that we are performing at our highest capabilities in this area, to ensure resources are being utilised correctly.

Objectives: Our aim was to audit staff performance and documentation of meetings, and to compare to results of last audit in 2013.

Methods: A retrospective chart review was conducted in December 2018. All patients who were discharged or deceased from 1st October to 30th November were included. Patients were identified through an online database - IPMS. Data was anonymised, stored on an encrypted drive, input into Microsoft Excel and basic statistical analysis was performed.

Results: 28 patients were included, 32.14% had documented formal family meetings (9/28). 100% of target was reached in 10/16 standards. Two areas with poorest performance were documentation of time (66.7%) and notification of Community Specialist Palliative Care Team (33.33%).

Conclusion: Improvement was noted in areas such as time documentation and notification of Community Specialist Palliative Care team, with room for further improvement. Staff were performing well across many areas. Fewer family meetings occurred in 2018 (32.14%) than 2013 (100%), this may be due to improved informal communication between staff and families on a day-to-day basis. Equally, families may not be aware of the option. As such, a patient/family information sheet was generated. Recommendations include re-audit in two years.
The Injured Cyclist: A retrospective cohort study of cycling-related injuries presenting to Cork University Hospital Emergency Department

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Introduction: The number of cyclists on Irish roads has consistently increased over recent years. Cyclist injuries have also increased, highlighting a need to characterize this patient population and assess the nature of their injuries.

Methods: Data on injured cyclists treated at Cork University Hospital (CUH) Emergency Department (ED) from 2013 – 2018 was retrieved from the Trauma Audit and Research Network (TARN) database. Patient demographics, injury details, and outcomes were analyzed.

Results: During this time 100 cyclists met TARN inclusion criteria. The median patient age was 45.9 years and 77% were male. Injuries to the head were the most common (32%). Of all head injuries, 90.2% were classified as serious, severe, or critical with an abbreviated injury score (AIS) ≥3. The median hospital length of stay (LOS) was significantly increased for patients with any head injury (11 vs 5 days, p<0.001) compared to patients without head injuries. Patients with head injuries were also significantly more likely to require treatment in intensive care units (ICU) (OR = 6.9, 95% CI 2.3 – 21.0) with higher median ICU LOS (9.5 vs 1 day, p<0.05). Furthermore, of the 3 cyclists that died in hospital, each had sustained a head injury of AIS ≥3.

Conclusions: As cycling increases in popularity, it is important to investigate cycling-related injuries that may present to EDs. Head injuries are the most common cycling-related injury associated with ICU admission, prolonged hospital stay, and death. This data, along with future research on helmet use, may have important public health implications for cyclist safety.
A 3D spheroid model for the study of dual cytotoxic-epigenetic drug therapy on oesophageal cancer cell growth

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Oesophageal cancer is one of the most common malignancies and the sixth leading cause of cancer-related death worldwide. Despite recent advances in treatment strategies, there has been no significant improvement in overall survival rate. Thus, new strategies are essential and warranted for early detection and to improve treatment options. One such strategy is looking at epigenetics as cancer is now understood to be a disease of widespread epigenetic dysregulation. Spheroid 3D culture models, which differ dramatically from 2D models, have an invaluable role in tumour biology and anti-cancer drug screening. We successfully grew 3D oesophageal cancer spheroids (which more closely resembles the solid tumour characteristics) in ULA plates as identified by immunofluorescence imaging. Images were recorded daily using a bright field microscope and their volumes calculated (SpheroidSizer1_0 program). Treatment of cancer 3D spheroids with older cytotoxic drugs, oxaliplatin and 5-fluorouracil, induced growth arrest of spheroids in a concentration-dependent manner. A similar dose response with the epigenetic HDACi drug, panobinostat was not observed. However, dual cytotoxic-epigenetic therapy with oxaliplatin/5-fluorouracil/panobinostat caused 86.4 ±1.1% decrease in oesophageal cancer 3D spheroid growth compared to control untreated 3D spheroids. Single treatments alone with oxaliplatin or 5-fluorouracil caused 50.9 ±1.3%, 70±2.4% decrease in 3D spheroid growth respectively. Thus, combination cytotoxic/epigenetic drug treatments had a significantly greater effect on reducing spheroid size and regrowth compared to singular treatments. Our findings suggest further investigation of the possible increased sensitisation effect of epigenetic drugs on oesophageal cancer 3D spheroid growth to chemotherapeutic drugs is warranted.
Microbiota regulates stress-induced alterations in the gut metabolome

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Stress-related alterations in homeostasis can manifest in the gut although the impact of acute stress on host-microbe interactions is poorly appreciated. We therefore sought to define the role of the microbiota in regulating gut homeostasis, luminal signalling, and metabolism in response to restraint stress. Adult male conventional (Conv), germ-free (GF), and colonized GF (ColGF) mice were randomly distributed to unstressed or stressed group, the latter subjected to a single acute stressor and sacrificed immediately or 45min following stress. Caecal contents and mucosal scrapings were taken for metabolomic analysis. The metabolic profile following stress exposure in GF animals was markedly different, indicating microbe-specific regulation of stress response. In particular, there were reductions in butyrate and acetate, short chain fatty acids (SCFAs) produced exclusively by gastrointestinal microorganisms which have an important role in host physiology. Colonocytes primarily use SCFAs to fuel the tricarboxylic acid (TCA) cycle through β-oxidation. Changes in the TCA cycle intermediates (glucose-6P, citrate and malate) were also observed in the colonocytes of Conv and ColGF groups after stress exposure, indicating a shunt of metabolism to produce energy. This stress-induced shift in colonocyte metabolism is subverted in the absence of gut microbiota but exaggerated in the ColGF group. These results proved the essential role of microbiota to regulate gastrointestinal metabolic homeostasis after stress. Further work is necessary in order to understand the connections and implications of stress-induced changes in gut metabolism and SCFA bioavailability; and how this could affect other relevant functions in the gut-brain axis in which they are involved including visceral perception or immune regulation.
Medication related quality of life [MRQoL] in ambulatory older adults with polypharmacy and multi-morbidity – a measurable outcome?

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Research pertaining to medication should focus on patient-related outcomes (potentially MRQoL), drug appropriateness and adverse reactions. This study explores baseline MRQoL and its relationship to medication burden/complexity, frailty, health related quality of life (HRQoL) and potential inappropriate prescribing.

A cross-sectional study over a year of cognitively intact out-patients ≥ 65 years with polypharmacy and multimorbidity. Baseline demographics, medication and medical history, frailty scale, STOPP/START v.2 and questionnaires for MRQoL, HRQoL were collected.

234 new-patients were screened, 59 met criteria (30 recruited - 3 subsequently ineligible). Female 18 (66%), mean age 79.41 years ± 6.22, median number of medications 10 (IQR 5), mean number of comorbidities 10.96 ± 3.24. Participants were compliant as per medication adherence rating scale [MARS] median 9, IQR 3.5 (max score 10). Patients reported good MRQoL, median 14 IQR 8.5 (measured via The Medication-Related Quality of Life Scale version 1.0 MRQoL-LS v.1 Tseng et al. 2015: lower scores represent better MRQoL, good 14-49, poor 50-84); median time 2 minutes IQR 1 to complete. Participants reported a low medication-burden via living with Medicines Questionnaire v.2 [LMQ-v.2] median 115.64 ± 25.18 (higher scores suggest higher burden, score 60-300) median time 12 minutes to complete IQR 3. There was no correlation between MRQoL, degree of polypharmacy/co-morbidities, LMQ, HRQoL, STOPP/START (pearsons 2-tailed p >0.05).

This study, demonstrates MRQoL-LS v.1 is not applicable to most patients attending geriatric medicine services. Although small numbers, polypharmacy, high comorbidity-burden, presence of PIMs, poorer subjective reported health does not correlate to a poorer MRQoL.
Assessment of the dimensional consistency of Coltène Hyflex EDM system

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Introduction: Endodontic treatment aims to eliminate pulpal tissue and micro-organisms from within the root canal system through the use of mechanical and chemical means. Mechanical debridement uses endodontic files of a known taper and diameter. Following successful debridement, a three-dimensional root filling is placed, which protects the tooth from further microbial invasion by eliminating all avenues of leakage from the oral cavity. The quest for an endodontic system offering predictable preparation and obturation outcomes has lead manufacturers to develop single file/cone systems. However, if cones do not match the respective files, the concept fails leaving the clinician with a suboptimal obturation, compromising the success of the endodontic treatment. The aim of this study is to assess any differences in diameter and taper which may exist between this new file/cone system of Coltène Hyflex EDM one file and their corresponding gutta percha cones.

Methods: A sample size of 157/79 GP cones/files had three fixed reproducible points marked. Using a Sylvac Micron Digital Callipers with a resolution of 0.001mm. The diameter of each sample was measured at each of the fixed points (D1, D2, D3) Taper for each sample was calculated.

Results: Gutta Percha Cones diameter range: D1 .32-.42mm, D2 .58-.63mm, D3 .82-.84mm EDM One files diameter range: D1 .38-.41mm, D2 .52-.54mm, D3 .79-.81mm Taper of GP cones 0.08-0.06, Mean taper of files 0.05

Conclusion: Dimensional discrepancies exist between Coltène Hyflex EDM files and their corresponding Gutta Percha points. This potentially could reduce endodontic success if the operator is dependent solely on the precision of this single file/cone system.
Investigation of the role of IL-36 cytokines in colon cancer.

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The IL-36 cytokines are a recently described subset of the IL-1 family of cytokines, shown to play a role in the pathogenesis of intestinal diseases such as Inflammatory Bowel Disease (IBD). Given the link between IBD and colitis–associated cancer, as well as the involvement of other IL-1 family members in intestinal tumorigenesis, the aim of this work was to investigate whether IL-36 cytokines play a role in the pathogenesis of colon cancer.

Ex vivo expression of IL-36α and IL-36γ, mRNA and protein, were found to be significantly increased in colorectal cancer tissue compared to adjacent non-tumour tissue whilst expression of both the IL-36R and IL-36R antagonist was unchanged. IL-36β was altered at the mRNA level only. Expression does not, however, correlate with stage, grade or patient prognosis. The IL-36 receptor (IL-36R) expression was unchanged at both the protein and the mRNA level. In vitro IL-36 cytokines, excluding IL-36α, increase cellular migration, cellular proliferation and inflammation in two colon cancer cell lines. Expression of the IL-36 cytokines was in turn seen to be induced by stimulation with inflammatory molecules such as TNFα, LPS, PGE2 as well IL-36γ itself. Taken together, these data show that certain IL-36 cytokines are increased in colon cancer and that tumour cells may respond to IL-36 ligand stimulation in terms of a positive increase in cellular proliferation, cellular migration and an induction of protumorigenic chemokines.
Gene co-expression analysis identifies histone deacetylase 5 and 9 expression in midbrain dopamine neurons and as regulators of neurite growth via the bone morphogenetic protein-smad pathway in cells overexpressing α-synuclein.

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Parkinson’s disease is characterised by the intracellular accumulation of α-synuclein which has been linked to early dopaminergic axonal degeneration. Class-IIa histone deacetylases (HDACs) have previously emerged as druggable targets, however it is not known which specific class-IIa HDACs should be targeted. To provide insight into this, we used gene co-expression analysis to identify which, if any, of the class-IIa HDACs had a positive correlation with markers of dopaminergic neurons. We further found that HDAC5 and HDAC9 are expressed in dopaminergic neurons in the adult mouse substantia nigra. We show that siRNAs targeting HDAC5 or HDAC9 and its pharmacological inhibition with the drug MC1568 can promote neurite growth in SH-SY5Y cells and primary neurons. Moreover, MC1568 upregulated the expression of the neurotrophic factor BMP2 and SMAD1. Furthermore MC1568 treatment of primary rat dopaminergic neurons increase cellular levels of phosphorylated Smad1, which was prevented by the BMP receptor inhibitor dorsomorphin. A functional link to BMP signalling was shown by the fact that dorsomorphin, overexpression of a Smad4 dominant negative or the inhibitory Smad7, prevented the neurite growth promoting effects of siRNAs targeting HDAC5 and a rescue experiment showed that supplementation with BMP2 prevented the neurite growth inhibitory effects of nuclear restricted HDAC5. Finally we report that siRNAs targeting HDAC5 or HDAC9 can promote neurite growth in cells overexpressing wild-type or A53T-α-synuclein and that MC1568 protected primary rat dopaminergic neurons against the neurotoxin MPP+. These findings establish HDAC5 and HDAC9 as novel regulators of BMP-Smad signalling, that may be therapeutic targets worthy of further exploration.
First Episode Psychosis (FEP) and substance use; Impact of Early Intervention Services (EIS)

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Introduction: Prognosis of schizophrenia has not significantly improved despite extensive research. The link between psychosis and substance use has been well-documented. Substance abuse, which includes alcohol and street drugs, is common among FEP patients, and Early Intervention Services (EIS) have the potential to detect hazardous substance use.

Aims: 1. To assess the prevalence and demographic correlates of substance use and abuse in patients treated at one EIS Centre in Cork, Ireland. 2. To assess changes in the prevalence and range of substance abuse before and after 12 months of EIS.

Methods: Voluntary in- or out-patients aged between 18 and 64 with were invited to participate and written informed consent was obtained. Demographic information and drug and alcohol use was measured at baseline and 12 months. Results: The sample (n=25) comprised 68% male, with a mean age of 34.8 years and 88% white Irish. The mean time from initial FEP presentation to EIS involvement was 15.5 days. At baseline; alcohol was the most commonly used substance (52%), followed by cannabis (40%), but at 12 months, this had decreased by 54% for those abusing alcohol and 60%, for those abusing cannabis.

Conclusions: The FEP population was found to be predominantly male, and alcohol and substance use is common. Engaging with EIS positively reduces their use and abuse.
Interviews with Healthcare Professionals Exploring Optimal Diagnostic and Post-diagnostic Processes and Pathways for People with Younger Onset Dementia in Ireland

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Background: One-in-ten people diagnosed with dementia in Ireland are under 65 years. People with younger onset dementia (PwYOD) and their families experience unique challenges. While research and policy for dementia care is rapidly developing, the specific needs of PwYOD remain overlooked. The study aim is to explore current and preferred diagnostic and post-diagnostic processes and pathways for PwYOD in Ireland.

Methods: Semi-structured interviews were conducted with healthcare professionals and healthcare managers (HCPs) selected from five regions across Ireland using purposive sampling. Data were analysed using Thematic Analysis.

Results: Overall, N=26 HCPs participated. HCPs involved in diagnosis saw the process as complex, but manageable once an appropriate referral was received. However, the real gap was the perceived lack of post-diagnostic supports. Existing dementia post-diagnostic supports are often not suitable for, or not available to, people under 65. In particular, PwYOD and their families need counselling and support around driving, working, and finances. Where there were examples of good services, these were often maintained by staff outside of hours and in an ad hoc basis.

Conclusions: HCPs recognise the unique needs of people who are diagnosed with dementia at a younger age, but also that currently in Ireland there is a lack of adequate post-diagnostic supports. As numbers affected may be small in some regions, having inclusive dementia supports as well as specific supports for younger people may be more feasible. A key worker would be valuable to link PwYOD and their families to available supports in a timely and responsive manner.
A mixed methods study exploring the knowledge, attitudes and practices to pharmacovigilance and adverse drug reaction (ADR) reporting in clinical trials

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Purpose: The purpose of this study was to explore the knowledge, attitudes and practices of health professionals working in clinical trials to pharmacovigilance and ADR reporting. Secondary objectives were to explore the reasons for underreporting of ADRs and to identify methods to optimise ADR reporting.

Methods: A mixed methods study comprising of responses from an online questionnaire and qualitative responses from semi-structured interviews and focus groups. The questionnaire was disseminated online from September to November 2018. Four focus groups and three semi-structured interviews were conducted with a random sample of those questionnaire participants who had provided their contact details. The qualitative interviews were conducted at a location convenient to the participant’s place of work between October and December 2018.

Results: One hundred and forty-eight participants completed the questionnaire. The majority of participants were study coordinators/project managers, 28.6% (n=38). Poor knowledge or understanding of ADR reporting was the most frequently cited barrier to ADR reporting, 75% (n=93). The most common enabler to reporting was having a clear understanding of an ADR definition, 85.7% (n=108). Focus group and interview participants described the challenge of having a limited resource of staff to report an ADR. They welcomed the prospect of pharmacovigilance training and suggested face-to-face training would be preferred to an online version.

Conclusion: This study has highlighted some of the key factors that influence the reporting of ADRs in clinical trials in Ireland. Findings suggest that clinical trial staff should be supported by pharmacovigilance training as this could optimise ADR reporting.
Expression of the novel Death Receptors, DR3 and DR6, in increased in colon cancer, with activation resulting in the induction of pro-tumorigenic functions.

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Background: The death receptors (DRs) are a subfamily of receptors that are characterised by a region called the “death domain” in their cytoplasmic tail, which transmits an apoptotic signal following ligation by their specific ligands. Whilst some members of this family, including CD95, DR4 and DR5 have been shown to be expressed by tumour cells, and can activate both apoptotic and non-apoptotic signalling pathways, little is known regarding the expression and function of the other novel DR family members, in particular death receptor 3 (DR3) and DR6, in cancer.

Aim: Given the potential pro-tumorigenic functions of CD95 and DR5, the aim of this study was to determine whether these novel DR family members are also expressed by colon tumour cells, and to investigate whether they exert pro- or anti-tumorigenic functions.

Results: Expression of DR3 and DR6 was increased in human colorectal cancer (CRC) cells relative to adjacent normal colon, with expression increasing with tumour stage, as assessed by IHC. High expression of DR3 is also associated with reduced survival. Human colon cancer cell lines also express DR3 and DR6, with stimulation of the cells with specific agonists resulting in the upregulation of pro-inflammatory factors. Moreover, activation of DR6 also increased the proliferation of these cancer cells in vitro.

Conclusion: Characterisation of the role of these receptors in cancer may identify novel targets for therapeutic intervention strategies in CRC.
Effects of prior juvenile stress on stressor-specific patterns of neural activation in adulthood: Role of Biological sex

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Stress during childhood (juvenile period of life), is a major risk factor for depression - a psychiatric disorder with a two-fold higher prevalence in women compared with men. Thus, in addition to stress, biological sex is an important contributor of depression susceptibility. However, how stress during childhood differentially affects the female and male brain to result in increased risk for depression in women later in adulthood remains unknown.

This project aims to identify brain regions linked to sex-dependent and sex-independent susceptibility to develop depression-like behaviour in adulthood following juvenile stress so that we can molecularly mine these brain regions for potential targets for antidepressant drug development. To this end, we examined c-Fos (a marker of neuronal activation) protein expression in several brain regions in response to a behavioural test of depression in adult male and female rats with or without a history of prior juvenile stress. Brain tissue from four experimental groups (non-stressed adult males, adult males that underwent juvenile stress, non-stressed adult females, adult females that underwent juvenile stress) were sectioned and underwent c-Fos immunohistochemistry. Microscopy images of various brain regions previously implicated in depression or the stress response were acquired and the number of c-Fos positive cells were counted. Preliminary data (n = 3) suggests that the dentate gyrus of the ventral hippocampus, and the lateral septum are candidate brain areas that may exhibit sexually dimorphic responses in adulthood following juvenile stress. Current studies are increasing sample size number and interrogating other candidate brain areas.
Diagnostic Biomarkers for Autism Spectrum Disorder (ASD): A Metabolomics Profiling Study in the Cork BASELINE Birth Cohort

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Autism Spectrum Disorder (ASD) is a neurological, developmental disorder that affects communication and behaviour. Currently, there is a lack of understanding about the aetiology of ASD and children are not diagnosed reliably until they are at least 3 to 4 years of age. Henceforth, there is an urgent need for identifying diagnostic blood biomarkers for ASD. The objective of this study is to develop an early screening metabolomic assay to predict ASD using advanced mass spectrometry methodologies and Artificial Intelligence (AI). Cord-blood samples for biomarker discovery are available from the Cork BASELINE birth cohort (http://www.baselinestudy.net/) and future biomarker validation work will be undertake in the Danish National Birth Cohort (https://www.dnbc.dk/). To identify differentially expressed metabolites between cases and controls metabolic profiling will be undertaken for all case and control samples, using non-targeted liquid chromatography tandem mass spectrometry. Raw metabolomic datasets will be analysed by Progenesis-QI and XCMS. Further, the clinical data (patient history, body mass index (BMI), maternal stress, infection, etc.) combined with metabolomics markers to explore various AI algorithms (e.g. random forest, neural networks) for identifying potential biomarkers that predict ASD. The study will improve our understanding of the molecular mechanisms implicated in the pathophysiology of ASD and has the potential to yield novel biomarker candidates by utilising multiple, uniquely well phenotyped cohorts.
Defining the Features of Registry Based Randomised Controlled Trials (rRCTs)

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Introduction: rRCTs have been increasing in prevalence in the last decade. These pragmatic trials utilise registries at a variety of trial stages, e.g. all or some of recruitment, randomisation, defining the outcome measures. Numerous rRCTs have been described in the literature however the level of registry engagement differs between trials and therefore leads to confusion as to what is a rRCT.

Objectives: To define the features of rRCTs with the goal of redefining rRCT nomenclature to provide consistency for researchers in the conduct of rRCTs and systematic reviews.

Methods After a systematic search, 3541 articles were screened, 105 full-text articles were reviewed and 68 included. Registry activity was categorised to four groups rRCT\textsubscript{Full}; rRCT\textsubscript{Recruitment(1)}; rRCT\textsubscript{Randomisation(2)}; rRCT\textsubscript{Primary Outcome(3)};

9 trials were categorised as rRCT\textsubscript{Full} (3 indicators used). 31 trials used a registry for 2 indicators and 29 trials used the registry for 1 indicator. 49 trials utilised a registry for recruitment. 12 trials used it for randomisation and 49 trials used it for primary outcome measure. Registry use was indeterminate for 10 studies.

Discussion: The potential of rRCTs for increasing trial conduct is enormous but currently underutilised. Only 13\% of trials fully utilised the registry. This is partly due to the uncertainty of when an rRCT is defined as such in the literature. It is essential researchers can review trials and duplicate their conduct. Therefore, defining the features of rRCTs is essential. Our rRCT categorisation defines rRCTs and in addition enables methodical research, systematic reviews and duplication of rRCTs.
Parental administration of analgesia to children attending the emergency department with acutely painful conditions.

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Objectives: To determine the prevalence of parent/guardian administration of analgesic medication to their children for the treatment of acute pain prior to Emergency Department (ED) arrival, and if not seek to explore their reasons why. Also to examine associations between socio-demographic factors and the likelihood of parents/guardians to administer pre-hospital analgesia.

Methods: A prospective questionnaire was given to parents of children aged 6 months-16 years attending the EDs at MUH and CUH, with acutely painful conditions. The questionnaire included questions relating to demographics, the child’s clinical presentation and analgesic management prior to ED arrival. The questionnaire was completed on a tablet using Survey Monkey.

Results: Data collection for this study is ongoing. So far 368 responses have been collected with the aim of reaching 400 participants. As statistical significance has not yet been reached I have been unable to fully analyse the responses. However preliminary results show that 53% parents did not administer analgesia prior to ED arrival, with the top three reasons being: 'Did not think the child needed it', 'Accident did not happen at home' and 'Did not want to mask the severity of the pain'.

Conclusion: Although data collection is incomplete the results so far indicate parents often do not give their children analgesia before presenting to ED. It appears parents often underestimate their children's pain or believe giving pain-relief could be harmful. If the final results identify parent misinformation as a barrier to children receiving appropriate pain management it would provide a compelling rationale for implementing educational strategies to correct misconceptions surrounding pre-hospital analgesia.
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Characterization of the Gut-Brain axis in pregnancy

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Pregnancy is characterized by marked changes in body microbial composition. Intriguingly, these changes take place simultaneously with neurodevelopmental plasticity, suggesting a complex dialogue between the microbes that inhabit the gastrointestinal tract and the brain. Studies in germ-free mice have shown abnormal brain development. Whether these alterations are due to the absence of microbiota during prenatal brain development is still unknown. We hypothesize that the maternal gut-brain axis could play an important role in programming brain health and disease. Thus, the aim of this work is to characterize the gut-brain axis in pregnancy. This project will help to understand the role of the microbiota in neurodevelopment. Furthermore, it could lead to novel approaches to the study of pathophysiology and treatment of neuropsychiatric disorders.
Safe prescribing: trainee doctors’ perceptions of preparedness and attitudes toward their pharmacology education

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Introduction Prescribing errors, often made by junior doctors, increase the risk of patient harm. Lack of prescribing knowledge necessitates the evaluation of medical school pharmacology education.

Aim This study explores University College Cork-trained interns’ preparedness for prescribing and their undergraduate pharmacological education.

Method This was a mixed-methods, descriptive cohort study. Questionnaires were distributed to 136 interns in the South Intern Network twice throughout their intern year, followed by focus groups.

Results Twenty-one questionnaire responses during the first half of the year revealed that 38.1% felt their pharmacology education prepared them for practice. 38.1% reported feeling stressed about prescribing. Most felt confident prescribing non-opiate analgesia (95.2%), opiate analgesia (61.9%), laxatives (81.0%), antibiotics (90.5%), and antiemetics (81.0%), whereas most did not feel confident prescribing sedatives (52.3%) and cytotoxics (85.7%).

Of the nineteen interns that responded in the second half of the year, approximately 30% felt that their pharmacology education prepared them for practice and 26.3% felt stressed about prescribing. Most felt confident prescribing non-opiate analgesia (89.5%), opiate analgesia (78.9%), laxatives (94.7%), antibiotics (89.5%), and anti-emetics (88.9%). However, the majority did not feel confident prescribing sedatives (68.4%) and cytotoxics (100%).

Qualitative feedback identified the need for more structured and consistent therapeutic teaching and evaluation with a focus on common medications prescribed by interns. The need for earlier introduction and increased availability of formularies and online resources to aid prescribing was identified.

Conclusion Results highlight the need for greater medical school preparation at University College Cork for prescribing in clinical practice and can inform curriculum changes to better prepare interns.
Inflammatory cytokine interleukin (IL)-6 impacts hippocampal long-term potentiation (LTP) in wild type mice with minimal impact on dystrophin-deficient mdx mouse comparators.

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Cognitive impairment is a hallmark feature of Duchenne muscular dystrophy (DMD), with similar deficits in cognition observed in the mdx mouse. Additionally, elevated interleukin-6 (IL-6), has been linked to cognitive dysfunction. Hippocampal long term potentiation (LTP) is the proposed molecular correlate of memory formation, but descriptions of this phenomenon in mdx mice are conflicting. Our aims were to, 1) compare LTP in WT and mdx mice and, 2) determine the effect of IL-6 on LTP.

Whole brains from mdx and WT mice (8-12 weeks-old) were sliced and maintained in either control or recombinant IL-6 (1nM) media. LTP was induced in both WT and mdx slices by high frequency stimulation of Schaffer collateral-CA1 fibres. Statistical analyses were performed using unpaired t tests with data expressed as mean normalised post-LTP EPSP slope speed ± SEM.

The magnitude of LTP was reduced in mdx slices relative to WT (204.3 ± 20.44% vs 228.1 ± 17.18%, n=5, p=0.4). Acute exposure to IL-6 significantly reduced LTP slope in WT slices relative to untreated controls (177.0 ± 11.28% vs 228.1 ± 17.18%, n=5, p<0.05). However, treatment of mdx slices with IL-6 did not significantly affect the LTP slope (180.6 ± 9.074% vs 204.3 ± 20.44%, n=5, p=0.3).

Although IL-6 significantly reduced post-LTP EPSP slope in WT hippocampal neurons, it did not significantly affect LTP in mdx mice. Loss of dystrophin modifies the sensitivity of hippocampal neurons to the neuromodulatory actions of IL-6. This may be important in cognitive dysfunction exhibited in these mice.

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Background: Influenza burden estimates help provide evidence to support influenza prevention and control programmes. The aim of this study is to estimate the burden of influenza-associated hospitalisations in Ireland by examining data from two national information systems over three influenza seasons, 2015/16-2017/18.

Methods: Two data sources were used: (i) the national surveillance system for influenza notifications (CIDR) and (ii) hospital discharge data on in-patient hospitalisations for influenza with ICD-10-AM codes (HIPE). We calculated the total numbers and proportions of influenza-associated hospitalisations in each influenza season (week 40 to week 20) by selected characteristics.

Results: We identified 8,013 and 9,344 influenza-associated hospitalisations. The national crude incidence rate was 99.3/100,000 population, [95%CI (96.5-102.1)] nationally. The overall age-specific incidence rate was higher in those aged 65 years and older 352.9/100,000 population [95% CI(338.3-367.5)] and the under five-year olds at 144.8/100,000 population [95%CI(131.8-157.7)]. The overall median length of hospital stay was five days (range 1-1,025 days). The proportion of cases admitted to intensive care unit were recorded at 6% and 9.8%, respectively. The case fatality rate was highest among influenza cases admitted to ICU (21.6%), whereas for hospitalised influenza cases in general it was 4.8%.

Conclusion: These findings are crucially important in enabling public health agencies to make informed policy decisions and provide baselines for evaluating vaccine impact and preventive measures for both high risk groups and the total population.
Identifying the Educational Needs of Staff in the Provision of Bereavement Care in a Maternity Hospital in Ireland

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Background: Bereavement care is central to the provision of support in all maternity settings however, staff express fear and anxiety in caring for this patient group. Research suggests that this is often due to lack of specific training and education. The aim of this study was to obtain feedback from staff on their training needs.

Method: A survey was designed to explore staff opinion on the preferred format and topics for education on pregnancy loss and bereavement care. This study was conducted at Cork University Maternity Hospital, a tertiary unit with 7,500 births per annum.

Results: 94 staff completed the survey over a 4-week period. 83% (n =78) were Midwives, 13% (n=13) were Doctors, and the remaining 3% (n=3) were Allied Health Care Professionals. Interestingly 73% of staff (69/94) responded that their educational needs in this area were currently inadequate; 75% (70/94) of staff responded with their preferred formats for education. A total of 84 suggestions were received. Thirty percent of suggestions (28/84) proposed regular formal training days, 16% (13/84) proposed information/education sessions, 10% (8/84) recommended ward-based information sessions, 7% (6/84) small-group sessions, 6% (5/84) group discussion.

Conclusion: The survey identified the specific educational needs from healthcare staff to support them in their provision of care for bereaved parents and families. We have rolled out one training session for staff in keeping with their requests and will re-evaluate the programme after a 12-month time period. Maternity hospitals need to prioritise time and resources to facilitate learning in the area of bereavement care.
A bioengineered nisin derivative to control biofilms of *Streptococcus uberis*.

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The emergence of new multi-drug-resistant organisms has created an urgent need to find new therapeutic options to eliminate pathogenic microorganisms. The use of peptide antimicrobials such as nisin is one such avenue. However, some bacteria possess a specific nisin resistance system (NSR) which cleaves the peptide thereby reducing its bactericidal efficacy. This resistance was identified in strains like *Streptococcus uberis*, a worldwide pathogen that causes mastitis in dairy cattle. The objective of this study was to investigate the ability of a nisin peptide termed PV, a derivative that was bioengineered to be impervious to NSR, to eradicate and inhibit biofilms of *S. uberis* ATCC700407 and DPC5344 compared to the wild type (WT). Both nisin PV and WT treatments were evaluated using crystal violet (quantity) and XTT assays (viability) as well as confocal microscopy via LIVE/DEAD® BacLight™ staining (viability and architecture). A significantly greater reduction in biofilm formation as well as metabolic activity was observed for both strains in the presence of nisin PV compared to WT. When pre-established biofilms were assessed, both peptides partially reduced the amount of biofilm. However, the metabolic activity of cells was significantly lower following treatment with nisin PV compared to WT. Furthermore, the confocal microscopy analysis revealed a higher number of dead cells on top of the biofilm and a reduced thickness after treatment with PV vs. WT. These results suggest that nisin PV is a promising and potent alternative to effectively reduce biofilm formation of *S. uberis* strains that possess NSR.
In vitro evaluation of short antifungal peptides on pathogenic Candida spp. and commensal vaginal lactobacilli

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The killer peptide (KP) has been demonstrated to be an effective therapeutic molecule against vulvovaginal candidiasis (VVC) in murine models. Nevertheless, its effects on members of the commensal vaginal microbiota, or on potential hosts that could be used to facilitate recombinant expression, have not yet been investigated. In this study, we evaluated in vitro the effect of KP, two new antifungal peptides (P-A and P-B) and the KP-derivative P6 on six pathogenic strains of Candida spp. strains, six commensal vaginal lactobacilli (CVL) and potential expression host strains, Escherichia coli BL21 [DE3], four Lactococcus lactis strains and Saccharomyces cerevisiae P351. The peptides were synthesized by Fmoc and inhibitory activity over a range of peptide concentrations was evaluated in agar plates after incubation (4h, 37°C) with 10³-10⁴ cfu/mL of the microorganisms in dH₂O. Candida spp. and potential hosts were sensitive to all peptides. Further investigations are needed to determine how best to heterologously produce these peptides. Importantly, with respect to vaginal health-related applications, CVL were resistant to all peptides. P-A and P-B exhibited lower minimal microbicidal concentrations than KP and P6, but the relative potency among peptides depended on the indicator strain. Surprisingly, 100 mM peptides had less activity than lower concentrations (0.1-10 mM). In conclusion, we designed new antifungal peptides with enhanced antimicrobial activity which, along with KP and P6, did not inhibit CVL. Studies on cell cultures and mice need to be performed to confirm these results prior to human testing.
Blood-based proteomic and metabolomic biomarkers for Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder; A Systematic Review

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Autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) are common neurodevelopmental disorders that alter social, academic, or occupational functioning. ASD prevalence is rising and evidence supports that early intervention improves clinical outcomes, however the optimal intervention window has often passed before diagnosis. Hence, there is an unmet need for early biomarkers predicting ASD. While many studies have reported alterations in the circulating proteome and metabolome, there is discrepancy in the literature and a need to consolidate findings to inform future investigations. We conducted a systematic review based on a prepared protocol of literature reporting blood-based predictive/diagnostic protein/metabolite markers of ASD and ADHD. Four databases were independently searched using the same search strategy by two researchers on the same day. Resulting articles measuring human protein/metabolite levels in blood since 2008 were included. We assessed 69 papers reporting potential diagnostic biomarkers for ASD and ADHD. Of these, 43 investigated proteomic biomarkers for ASD, 21 investigated metabolomic biomarkers in ASD, and the remaining 5 investigated proteomic and metabolomic biomarkers for ADHD. For ASD, we identified 149 proteins, 36 of which were altered in at least two studies, and 76 metabolites, 18 of which were altered in at least two studies. For ADHD, we identified 2 proteins and 5 metabolites altered in at least two independent studies. A pathway analysis of ASD biomarkers revealed an enrichment of proteins linked to immune/inflammatory activation, particularly implicating the IL-17 protein pathway, and novel insights into the potential role of Farnesoid X Receptor-regulated metabolic dysfunction in neurodevelopmental disorders.
Development of a Website for First Trimester Miscarriage

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Introduction: It is estimated that one in four pregnancies result in a first trimester miscarriage. For many women, this loss is often compounded by silence and stigma. This patient cohort often describe feeling unsupported in their loss due to a lack of helpful and reliable information on early miscarriage. The aim of this work was to design a website specifically focused on first trimester miscarriage in an effort to respond to this need.

Description: During the development phase, the information was written by a CMS and Parent Advocate and the website was constructed in collaboration with the design team. The layout and visual aspects were key components of its development, in addition to sourcing a host site and creating a domain that would be accessible to parents and staff. Feedback was sought from a variety of clinical and academic staff (bereavement team, research group) in addition to a group of bereaved parents. The content was refined from the feedback received. The website provides information on varying aspects of miscarriage. While the site is specific to the services in CUMH, the information is relevant to maternity services nationally and internationally.

Summary: Medically accurate, accessible information that is written in a sensitive and visually appealing way is the ethos for this website. The website aims to be a resource for parents with miscarriage concerns or experience first trimester miscarriage and will be a reference for clinical staff who care for bereaved parents through the difficult journey of miscarriage.
Examining the Barriers and Facilitators to Contraceptive Healthcare in Cork city: Perspectives of Healthcare Workers.

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Despite noted progress in contraception access in Ireland over the last 30 years, the rate of crisis pregnancies is increasing. The use of effective methods of contraception particularly Long-acting reversible contraception (LARC) is proven to reduce the rate of unplanned pregnancies worldwide. However, LARC use in Ireland remains relatively low. This study aims to examine the barriers and facilitators to contraceptive healthcare from a healthcare workers perspective.

Healthcare workers (HCWs) were recruited through purposeful and snowballing sampling to partake in one-on-one interviews. Utilising NVivo 12 to organise the data, a framework approach adopted from Bertrand et al, 1995 was used to qualitatively analyse the content.

Sixteen HCWs consisting of 12 General Practitioners (GPs) and 4 nurses were interviewed. Cost of contraception, public knowledge and education were the most common barriers identified. Additional barriers include provider knowledge and skills, time and language constraints, fear of LARCs, family and peer influences. Suggestions to facilitate contraceptive healthcare include the provision of free or subsidised contraceptive healthcare, public information campaigns and improved education on contraception and accessible, improved and continuous training for HCWs.

As the end of term of the Sexual Health Strategy 2015-2020 approaches, this study indicates persistent barriers to contraceptive healthcare in Ireland. The reinforcement of a multisectoral collaboration involving different government departments, the private sector and NGOs is necessary to improve contraceptive healthcare in Ireland. Furthermore, consistent monitoring, evaluation of interventions such as free contraception, public health campaigns and HCW training are warranted to inform future policy.
A National Survey of Clinicians who Assess People with Suspected Dementia: Service Characteristics and Diagnostic Practice

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Background: The Irish National Dementia Strategy (2014) identified timely diagnosis and intervention as a priority area. As part of improving diagnostic services, a national survey explored baseline geriatric medicine, neurology and psychiatry of old age services.

Methods: A survey was distributed to all 86 Geriatricians, 39 Neurologists, and 34 Psychiatrists of Old Age Psychiatrists in Ireland. Two reminder e-mails were sent.

Results: In total, 56 clinicians responded (response rate 35%). The majority (74%) saw 1- 20 people with suspected dementia (PwSD) per month. Most referrals came from General Practitioners or other physicians; rarely from other disciplines. Most people were referred specifically for their memory complaint. Waiting times for urgent review varied between 24 hours and 4 years; neurology services had the longest waiting times. Only 30% of respondents saw PwSD in a dedicated ‘memory’ clinic. About half reported assessing PwSD who had an intellectual disability, mainly neurologists. The Montreal Cognitive Assessment was the most commonly used cognitive tool (89%), followed by the Addenbrook’s Cognitive Examination (56%). Only 17% commonly used functional brain imaging in diagnosis (mainly neurologists); half of respondents ‘never’ or ‘rarely’ used cerebrospinal fluid analysis. Multidisciplinary input was mainly from Occupational Therapists (61%), Psychology/Neuropsychology (52%), and Nursing disciplines (33%). When asked which additional discipline would most benefit their service, neurologists chose psychology input; geriatricians selected a range of disciplines.

Conclusion: The significant variability within current services who see PwSD, in terms of multidisciplinary involvement, waiting times, setting, and investigations, supports the need for a national diagnostic framework.
The value of a teardrop alert system

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In 2009, a “Teardrop Stillbirth Alert Symbol” was introduced in CUMH. This was placed on the woman’s paper clinical notes when she had a history of perinatal loss or it was anticipated in her current pregnancy. The function of this symbol was to alert staff to enhance communication and avoid exacerbating patient distress. In 2016, an electronic chart (MN-CMS) was launched in CUMH.

\textbf{AIMS:} The study aimed to assess staff opinion on the use of the pregnancy loss alert symbol and to determine accessibility of stillbirth information on the electronic chart. 

\textbf{RESULTS:} Three hundred clinical staff at CUMH were surveyed with a 52% response rate. The majority of participants (93\%) stated that previous use of the teardrop symbol on paper notes had been helpful in their practice. There was significant support (97\%) for the introduction of a similar alert symbol on the MN-CMS. When reviewing the MN-CMS charts, only 36\% of those where the woman had experienced a previous stillbirth were identifiable or “flagged” with a generic red flag or the word “flagged” on the main maternity view banner. This made it difficult for staff to identify patients with a previous stillbirth.

\textbf{CONCLUSION:} While the electronic record is a valuable tool, the introduction of a specific pregnancy loss alert symbol would benefit clinical practice. It is important that we maintain the human essence of a patient chart as we move to an electronic era of information recording.
Sleep Microstructure Changes in Routinely Massaged Infants

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Introduction: Sleep is essential for brain development and maturation. Massage, as a form of environmental enrichment, has been shown to be have a beneficial effect on brain activity in preterm infants, however there is a paucity of studies examining the effects of massage in term babies and older infants. Sleep spindles are electroencephalographic (EEG) transients seen in non-REM sleep that result from oscillatory activity between the cortex and thalamic nuclei and are thought to be involved in sleep maintenance, processes of neuroplasticity and long-term memory consolidation. The evolution of the sleep spindles in early infancy reflects brain maturation and development. Here we study the effects of massage on sleep spindles at 4 months of age.

Methods: Healthy full-term neonates were recruited at birth and randomised into control and massaged groups. The parent-led massage was given one to three times daily for the first four months of life and a 4 month daytime sleep EEG recorded. Sleep spindles were manually annotated and analysed for duration, frequency, symmetry, and spectral power using Two-sample Mann-Whitney U test.

Results: A total of 179 sleep EEGs were recorded and 58,008 sleep spindles were identified. The spectral power of sleep spindles was significantly different between the groups (p=0.016). No differences were found in other metrics. The investigator is currently blinded to the groups due to ongoing analysis.

Conclusion: This study suggests routine massage in the first four months of life modifies sleep microstructure. Further study will examine macrostructural aspects of infant sleep including sleep stages.
Artificial Intelligence for Biomarker Discovery and Validation in Preterm Birth: A method to improve biomarker candidate selection and validation.

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Advancements in mass spectrometry is driving biomarker discovery workflows which generate huge datasets, but extracting key biomarkers associated with a clinical phenotype remains challenging. Artificial Intelligence has become widely adopted in many aspects of research precision medicine. Machine Learning (ML) in combination with omics technologies can provide accurate, personalised diagnostic tools for clinicians. Here we present a ML workflow which can be applied at all stages of metabolomics biomarker analysis, from discovery to validation, with the goal of improving biomarker selection for validation and prediction of spontaneous pre-term birth (sPTB). Herein, we describe the application of ML for 1) assessment of clinical markers, 2) prioritising predicative candidate biomarkers, and for 3) the development of predictive models of PTB.

Clinical markers currently used for determining sPTB risk assessed. Although features identified as most indicative of sPTB were all previously reported as risk factors, they failed to be robust for prediction of sPTB, highlighting the need for a reliable biomarker panel to be identified.

Discovery metabolomics quantifies a substantial number of unidentified compounds. Traditionally differences in expression have been used to select those which will be selected for identification and validation. Here we suggest a ML approach for compound selection which will model the interactions between compounds and prioritise predictive value when selecting a biomarker panel for identification and validation. Once identified predictive models will be applied to an independent validation cohort to determine the performance of the identified biomarker panel as a method for reliably identifying those at risk of sPTB.
The Prevalence of Pulmonary Arterial Hypertension and Clinical Outcomes among an Irish pre-Lung Transplant Cystic Fibrosis Patient Cohort: a Single-Centre Retrospective Study.

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The prevalence of pulmonary arterial hypertension (PAH) among the pre-transplant Cystic Fibrosis (CF) population has become a rising concern in recent years. Reported prevalence in the literature ranges from 26.0%-63.2% between international centres.⁴,⁵ Here for the first time; we examine the prevalence of PAH in an Irish pre-transplant CF single-centre cohort.

This study retrospectively examines the pre-transplant trans-thoracic echocardiogram (TTE), right heart catheterisation (where applicable) and spirometry results for all patients in the HSE South Adult CF Service undergoing lung-transplant assessment from 2009-2019. TTE results were scrutinised for evidence of increased right-heart pressures (raised RVSP, right-ventricular dilation, inter-ventricular septal flattening, right-atrial dilation, tricuspid regurgitation). Concomitant spirometry results were collated.

A cohort of 20 patients underwent transplant work-up from 2009-2019. Figure 1 summarises their outcomes. 60% of included patients demonstrated evidence of increased right-heart pressures. The results suggest poorer outcomes within this group. Spirometric results showed a mean FEV1 0.95L(27.2% predicted).

The data presented demonstrates a high prevalence of 60% for mild-moderate PAH among this Irish pre-transplant CF single-centre population with severe obstructive lung disease. This single-centre data supports the need for further interrogation of the national pre-transplant CF population to establish the true overall prevalence and clinical significance of PAH.

References

Stress during puberty exerts sexually dimorphic effects on antidepressant-like behaviour

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Stress is a major risk factor for the development of major depression. Depression is twice as prevalent in women compared to men and this difference only emerges after puberty, suggesting that puberty may be a sensitive period during which sex-dependent vulnerability to depression might become established. However, no studies have yet investigated whether stress occurring specifically during the pubertal period is responsible for this sex difference in depression vulnerability. Thus, in this study male and female rats were exposed to a three-day stress protocol specifically during puberty (postnatal days 35-37 in females, 45-47 in males) and underwent behavioural tests in adolescence measuring anhedonia, anxiety, locomotor activity and antidepressant-like behaviour. Pubertal stress reduced antidepressant-like behaviour in the forced swim test in both sexes but did not impact the other behaviours measured. Interestingly, this effect was manifested via different behavioural strategies whereby pubertal stress decreased climbing behaviour in males only and decreased swimming behaviour in females only. Previous studies have implicated the serotonergic system in swimming behaviour and the noradrenergic system in climbing behaviour in the forced swim test, thus current studies are interrogating whether pubertal stress differentially affects these neurotransmitter systems in males versus females. Taken together, these data suggest that stress during puberty exerts sex-specific effects on antidepressant-like behaviour possibly through discrete neurotransmitter systems. While such effects are reminiscent of sex differences in the clinical manifestation of depression, they do not support the hypothesis that stress during pubertal development makes females more vulnerable to developing depression than males.
Rapid Analysis of Urinary Neurotransmitters Using Hydrophilic Interaction Liquid Chromatography Coupled to Boron-Doped Diamond Electrode

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Neurotransmitters are metabolites that work as intercellular communication through the nervous system and carry out information between two or more neurons. During the transmission of impulses from the receptors to the central nervous system and vice versa, the neurons transmit it as an electric signal. The neurotransmitters bridge the spaces between neurons allowing the message to be passed from one neuron to another (1). Therefore, their biological role is crucial for many physiological functions and their levels can be changed by several diseases and neurological disorders such as cancer, cell proliferation, and Parkinson’s disease. Hydrophilic interaction liquid chromatography (HILIC) provides an effective separation of polar compounds which poorly retained on reversed-phase liquid chromatography (2). Electrochemical detection (ECD) based on boron-doped diamond (BDD) electrode provides high sensitivity for neurotransmitters detection. The separation of neurotransmitters is investigated first on HILIC-UV by adjusting the ratio of organic modifier in the mobile phase, flow rate, temperature, buffer pH, and buffer concentration. In this study, an optimized HILIC-UV detection method based on Zic-cHILIC column is developed for simultaneous analysis of dopamine (DA), serotonin (5-HT), norepinephrine (NE), and their metabolites 5-hydroxyindole-3-acetic acid (5-HIAA), vanillylmandelic acid (VMA), and homovanillic acid (HVA). This approach is applied successfully to separate three neuroblastoma and carcinoid tumour markers HVA, 5-HIAA, and VMA in artificial urine sample.
The impact of age-associated microbiota on neuroimmunity, physiology, and behavior in germ-free mice

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The gut microbiota has been implicated in regulating brain, behavior and immunity across the lifespan. Aging is associated with deteriorations in cognition and increases in central and peripheral inflammation. Altered microbiota diversity and composition is also a hallmark of the ageing processes. Previous studies have shown that by targeting the microbiome it is possible to affect neuroimmune signaling in midlife and ageing. However, it is unclear if the age associated changes in microbiota composition sufficiently alters neuroimmunity.

In this study we used microbiota deficient germ-free mice as a background to assess whether age-associated microbiota can differentially impact host neuroimmunity, physiology, and behavior by transferring microbiota from aged or young mice into young germ-free mice. After four weeks of bi-weekly fecal microbiota transplant, mice underwent the novel object recognition cognitive behavior test then were immediately culled. Flow cytometry was performed on blood and mesenteric lymph nodes, revealing alterations in systemic and gut-associated immune cell quantity and receptor expression with microbiota colonization, depending on donor age. Ongoing analysis involving hippocampal RNA sequencing will reveal whether transplantation of microbiota from aged or young donor mice to young germ-free mice also alters brain chemistry and other aspects of neuroimmunity uniquely. Interestingly no differences were observed between colonized mice in the novel object recognition behavioral test.

This research will illuminate the causal significance of changes in microbiota composition in exacerbating aspects of aging. Moreover, it opens up the opportunity of further targeting the microbiome for generating health brain ageing strategies.
Using a television programme as a tool to increase perceived awareness of mental health and wellbeing – Findings from ‘Our Mental Health’ Survey

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International research shows that media can increase knowledge, raise public awareness and reduce stigma relating to mental health.

In the weeks following the airing of a documentary on national television covering interviews with young men and women who had experienced mental health difficulties and suicidal behaviour, an anonymous online survey was conducted among the general public and college students using a mixed methods approach.

In total, 2,311 people completed the survey. Of those who watched the documentary (45%; n=1,042), nearly two thirds (65%) were aged 18-25. 94% believed that the documentary will have a positive impact on young people’s mental health and wellbeing, 91% stated that the documentary will encourage young people to open up and talk to someone if they are experiencing problems and 87% indicated that the documentary will help to reduce stigma associated with mental health. In response to the open-ended question on the part of the documentary that is likely to have the biggest impact, participants indicated that identifiable personal stories, the discourse around stigma and shame, and increased understanding and awareness, had the most profound effect.

The findings, based on validated measures, indicate that a television documentary addressing mental health and suicidal behaviour is perceived as having a positive impact in terms of reducing stigma related to mental health, addressing common misconceptions and encouraging help seeking behaviour. Documentaries with a strong public mental health focus and a consistent message to maintain and promote conversations about mental health and help-seeking behaviour, incorporating pre and post evaluations, should be considered.
Paramedical Perceptions of Their Role in End of Life Care in Ireland

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Introduction: Critical decisions made in the field by paramedical practitioners influence where patients die, if their end of life (EOL) wishes are upheld and how appropriately health-care resources are used. Despite this, paramedical services rarely have practice guidelines or protocols that address the unique challenges presented by patients at EOL.

Objectives: Explore current practice regarding EOL care in Ireland. Identify if there is a rural/urban variation in current practice. Gauge perceptions amongst paramedical staff as to their future role in enhancing EOL care in Ireland.

Methods: A qualitative approach was employed to collect data through two focus group interviews. A convenience sample of fifteen practitioners (group 1 n=7, group 2 n=8) took part in this study. Focus groups were audio recorded, transcribed and analysed using Attride–Stirling’s framework for thematic network analysis.

Results: The global theme ‘Paramedical Perceptions of Their Role in End of Life Care’ emerged from five organising themes: 1. education and training; 2. current clinical practice guidelines; 3. communication; 4. environment and 5. staff support. Poor communication between those involved in patient care, lack of support from current clinical practice guidelines, limited training in managing EOL scenarios and inadequate staff supports were highlighted by participants. The clinical environment also effected how challenging practitioners found the call.

Conclusions: The pathway to improving EOL care must include an emphasis on improvements in practitioner education and training, enhanced communication between all those involved in a patient’s care and offering non didactic practice guidelines that are practitioner driven and patient-focused. It must also include increased psychological supports for paramedical practitioners dealing with EOL patients.
Early promising clinical response with Triple Combination CFTR modulator therapy (Elexacaftor/Tezacaftor/Ivacaftor) in the first CF patient worldwide with a residual function mutation and severe disease (ppFEV1 23%)

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Triple Combination therapy in patients with ppFEV1>40% show improvements in lung function (absolute ↑ ppFEV1 of 13.9), sweat chloride (↓ of 42.2mmol/l), BMI (↑ of 1.13 kg/m²) and rate of pulmonary exacerbation (63% ↓ in annualized rate)¹.

We report the first patient worldwide, with ppFEV1<30%, treated with TC therapy. Following 5 weeks, improvement in lung function (23→28%ppFEV1), sweat chloride (70→40mmol/l), walk-test (300→430m) and weight (42.6→44kg) was observed. Continuous oral antibiotics were discontinued and she has not required IV antibiotics or admission. She was suspended from lung transplant listing.

These findings support TC therapy in severe disease and in potential deferring/bridging to transplantation.
Sustained 12 month effectiveness with CFTR modulator (Ivacaftor/Lumacaftor). ROCK (Real-world Orkambi CorK) study results.

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Objectives: Recent clinical trials have supported the efficacy of Lumacaftor-Ivacaftor (Orkambi). We aimed to evaluate real world clinical effectiveness over 12 months.

Methods: Thirty-one standard clinic patients with a PhelF508del homozygous mutation were assessed at baseline, 3, 6, 9 and 12 months’ post initiation of treatment. Changes in 1) clinical parameters including ppFEV1, BMI, IV antibiotic usage, number of hospital admissions 2)surrogate markers of CFTR modulation-sweat chloride, 3)disease/quality of life–related symptoms questionnaires 4)plasma/sputum inflammatory mediators were measured.

Results: Significant and sustained improvement in lung function(ppFEV1↑4.8%-p<0.001), BMI (↑0.9kg/m2–p<0.001), sweat chloride(↓17.6 mmol/l–p<0.001), IV antibiotic usage(↓84%-p<0.001) and hospitalisations(↓87%-p<0.01) at 1 year was noted.

Improvements in quality of life were demonstrated; CFQ-R respiratory domain(+7 points–p<0.001), CFQ-R digestive domain(+6.6 points–p<0.05).

Improvements in patient reported outcomes included; FACIT fatigue score(↑5.6–p<0.001) and sino-nasal-outcome-test(↓2.9–p=0.001). A significant change in sleep quality was not observed.

Plasma IL-1β(p<0.001), plasma TNF-α(p<0.01) and sputum IL-1β(p=0.001) were also reduced.

Conclusion: Our real world cohort supports recent clinical trials with improvements in lung function, BMI, CFQR respiratory domain and exacerbation reduction. Our study additionally highlights improvements in sweat chloride, CFQR digestive domain and an important patient reported outcome of fatigue reduction.

The ROCK study supports sustained clinical effectiveness at 12 months.
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The Virtual Doctor: Optimising unscheduled visits for Cystic Fibrosis (CF) using Artificial Intelligence

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In addition to the standard quarterly review, patients often contact the CF Multidisciplinary Team (MDT) via phone to express health-related concerns which may require a phone evaluation before organizing an unscheduled appointment. Current resources are often heavily affected by the sporadic nature of these interactions. Furthermore, data from the European CF registry predicts that there will be a 75\% increase in the adult CF population by 2025 which will further impact these limited resources\textsuperscript{1}.

For this reason, creating a system which could collect and report the patient’s status so that the MDT can take timely and appropriate action would optimize the existing process.

A series of meetings was held with members of the MDT and UCC Computer Science Department to develop an appropriate series of clinical questions. Two scoring systems were developed to evaluate the patient’s condition and the change between their current and baseline conditions. Assessment and triage of patients will be partly based on these scores. The system has been developed for web and interacts with the patient via speech.

A prototype has been developed and undergone technical evaluation. The front-end 3D avatar interface is currently in development before undergoing pilot testing and review with patients.
Does Domperidone Prolong QTc in a Clinically Relevant Manner in Infants with GORD? A Systematic Review

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Background: Recurrent regurgitation of gastric acid causing discomfort or poor weight gain, termed GORD, represents a common problem among infants. Reflux of high volumes of acidic fluid has important implications for neonatal health, with higher rates of respiratory distress syndrome and longer length of stay. Domperidone is a prokinetic agent used for the pharmacological management of GORD in some infants; however, questions remain around its safety, particularly in relation to its arrhythmogenic potential.

Aim: To assess whether domperidone induces clinically relevant prolongation of QTc interval or arrhythmia in infants receiving treatment for GORD.

Methods: Systematic review of clinical trials assessing domperidone use in GORD. PubMed, MEDLINE and Cochrane CENTRAL databases were searched from inception to 01/09/2019 with the following strategy: “((infant) OR (neonate) OR (newborn)) AND (domperidone) AND ((QT) OR (QTc) OR (prolonged) OR (electrocardiogram) OR (ECG) OR (EKG) OR (arrhythmia))”.

Results: 37 abstracts were identified (Medline 21, Embase 16, Cochrane 0) with 21 unique studies, of which five were included. Exclusions were found to be either replicates or inappropriate in subject matter or design. Included studies conducted ECGs prior to and following commencement of domperidone. None of the included studies reported placebo-controlled arms. Domperidone was found to cause QTc prolongation (>450 msec) in 4.4% of treated infants on average. However, no participants were recorded to experience arrhythmias.

Conclusions: Domperidone treated infants infrequently (i.e., <5%) displayed QTc prolongation at doses used for the management of GORD in infants. Domperidone treatment did not confer arrhythmogenic effects. Future RCTs should be conducted with placebo-controlled arms.
Primary PCI in Cystic Fibrosis: An unusual medical intervention?

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We present a 67 year-old female with Cystic Fibrosis (CF) (ΔF508/R117L – sweat chloride 63mmol/L; 78mmol/L); FEV1 55% predicted; known coloniser of P. aeruginosa and MRSA; evidence of CF Liver Disease and Dyslipidaemia (Total Cholesterol 6.2mmol/L; LDL 4.0mmol/L); pancreatic sufficient but no evidence of CF-related Diabetes. Additional background includes Rheumatoid Arthritis (on Methotrexate and Etanercept) and a remote history of smoking.

She was admitted for an elective work-up for sciatic nerve pain, when she acutely developed nausea and palpitations over 24 hours. An ECG revealed normal sinus rhythm with poor R-wave progression. Subsequent Troponin-I was elevated at 0.17µg/L. Following Cardiology review she underwent coronary angiography with PCI.

This demonstrated a discrete lesion with concentric high-grade stenosis of the proximal LAD (70-90%), and was ballooned and stented – with excellent angiographic result (images will be presented). This represents the first case of ACS and PCI in an Irish CF patient.

CF is a genetic condition classically associated with recurrent respiratory tract infections culminating in premature death from respiratory failure. With improved therapies including CFTR-Modulators, patients are living longer, and face the prospect of rising co/multi-morbidities. Cardiovascular disease is influenced by dyslipidaemia, chronic inflammation and increased arterial stiffness; all of which are noted in CF.¹,² This case highlights a potential new challenge for patients living longer.

References:

Bifidobacterium longum Supplementation Improves Fasting Blood Glucose, Active Ghrelin levels and Cortisol Awakening Responses in Healthy Obese adults: A Randomised, Double-blinded, Parallel, Placebo-Controlled Study

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Obesity and its comorbidities are one of the biggest health concerns for society. It is widely recognised that the gut microbiota plays a central role in obesity symptomatology. This makes gut microbiota a prime target for therapeutics aimed at reducing obesity and its sequelae. The bacterial strain Bifidobacterium longum has previously been shown to ameliorate obesity symptomatology, affect the ghrelinergic system and reduce levels of the stress hormone corticosterone in diet-induced obese mice. We therefore hypothesised that B. longum supplementation reduces body-mass index, waist-to-hip ratio, fasting glucose levels, cortisol awakening response (CAR) and modulate the ghrelinergic system in healthy overweight/obese individuals. Participants received B. longum (n=74) or placebo (n=48) supplementation for 12 weeks. Anthropomorphic measures and blood profiles were taken at the onset of the study, in the middle and at the end, whereas CAR was assessed at the beginning and the end of the study. No differences in body-mass index and waist-to-hip ratio were observed throughout the study. Nonetheless, B. longum significantly reduced fasting blood glucose levels over the 12-week treatment period, which was absent in the placebo group. Sub-population analysis of the obese participants revealed that B. longum also reduced CAR, as well as increased active ghrelin levels, which is known to be reduced in obese individuals. These results reveal that B. longum supplementation has promising potential to ameliorate specific aspects of obesity symptomatology in healthy overweight/obese individuals.
Sequence of treatment using targeted therapy and Immunotherapy in BRAF mutated metastatic melanoma

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Introduction: Advanced melanoma traditionally carries a poor prognosis. Two new classes of drugs-BRAF+MEK inhibitors and Immunotherapy (IT)- are improving prognosis. Patient eligibility for the drugs depends on BRAF mutational status, with patients who have BRAF mutated melanoma suitable for both BRAF+MEK inhibitors and IT. This cohort is roughly 50% of melanoma patients. It is currently unclear which is the best sequence of treatment.

Aim: To determine what is the best sequence of treatment (BRAF+MEK inhibitors first line followed by IT or the reverse sequence) when treating BRAF mutated advanced melanoma.

Methods: A retrospective analysis of the cohort treated in CUH from 2012-2018 with both drugs was reviewed (n=24). 12 patients received a BRAF+MEK inhibitor first line followed by IT second line (Group 1). The other 12 received IT then BRAF+MEK inhibitor (Group 2). Disease Control Rate (DCR), Progression Free Survival (PFS) and Overall Survival (OS) were measured and compared between cohorts. SPSS version 1.0.0.1298 was used for statistical analysis.

Results: The DCR was 91.7% in Group 1 vs 25% in Group 2. PFS was 5.5 months in Group 1 vs 1.75 months in Group 2. Median OS was 14.63 months in Group 1 vs 23 months in Group 2.

Conclusions: A significantly better DCR and PFS was achieved with a BRAF+MEK inhibitor first line vs IT. However, median OS was higher when receiving IT first line vs BRAF+MEK inhibitor. Therefore, receiving a BRAF+MEK inhibitor first line may provide better control of metastatic melanoma initially, but receiving IT first line may result in better OS.
The accumulation of autophagic vacuoles in the Alzheimer’s disease brain is not caused by impaired lysosomal digestion

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The accumulation of autophagic vacuoles (AVs) is a hallmark of degenerating neurons in Alzheimer’s disease (AD). The central aim of this study was to determine if autophagic pathology in AD is caused by impaired lysosomal proteolysis.

Methods and Results: Differential models of impaired autophagic flux were induced in rat primary cortical neurons: (1) Impaired lysosomal digestion (leupeptin and cathepsin L and B inhibition), (2) Lysosomal deacidification (chloroquine and bafilomycin), (3) Impaired delivery of AVs to lysosomes (U18666A) and (4) Lysosomal rupture (Glycyl-L-phenylalanine 2-naphthylamide (GPN)). In primary cortical neurons, inhibition of cathepsins L and B caused an accumulation of APP-CTFs, with preferential increases of two non-canonical truncated CTFs (CTF-6 and CTF-7). The absence of CTF-7 in neurons treated with chloroquine, bafilomycin or U18666A, suggests CTF-7 is a transient by-product of lysosomal digestion. AD brain samples had increased expression of LC3-II and p62 from Braak Stage II onwards, indicative of impaired autophagic flux. However, expression profiles of APP-CTFs and active cathepsin D were unaltered across all AD brain samples.

Conclusions: APP-CTF-7 is a novel biomarker of impaired lysosomal digestion, which did not accumulate in AD brains at different stages of the disease. This finding provides evidence that the accumulation of autophagic vacuoles in the AD brain does not stem from impaired lysosomal digestion.
A retrospective review of molecular testing patterns and downstream consequences in Colorectal Cancer patients from an Irish cancer centre

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Introduction: There are 1.2 million new cases of CRC each year. Ras/Raf and MSI testing direct treatment, prognosis and identification of Lynch Syndrome. The aim of this study was to investigate the patterns and consequence of genetic testing in Irish CRC patients.

Methods: A retrospective study of CRC patients from an Irish cancer centre over a 6 year period from 1st January 2013 to 1st January 2019 was carried out.

Results: 172/352 (49%) of patients had testing for MSI performed using IHC or PCR of which the MSI-H detection rate was 18%. 9/31 MSI-H patients were sent for downstream germline testing with one Lynch Syndrome identified. 153/352 (43.5%) had KRAS testing of which 64 mutations were detected (41.8%). 123/352 (34.9%) had NRAS testing with 7 mutations detected (5.7%). 126/352 (35.8%) had BRAF testing with 16 mutated (12.6%). Amongst Stage 3/Stage 4 patients; IHC, NRAS and BRAF testing increased by 36%, 50% and 65% respectively from 2013 to 2018. No statistical difference was observed between RAS mutated/wildtype patients for PFS/OS. BRAF wildtype patients (n=94) had an OS of 32.3 months, BRAF mutated patients (n=16) had an OS of 19.5 months (p=0.004).

Discussion: In response to the growing importance, an upward trend in testing was observed at this Irish cancer centre. Detection rates of KRAS and NRAS are on par with findings from other Caucasian populations while there is higher prevalence of dMMR and BRAF mutations in this population. BRAF mutation was shown to be a very poor prognostic factor.
Real-world dosing and safety of palbociclib in patients with hormone receptor (HR)-positive/HER2 negative metastatic breast cancer treated on a compassionate access programme

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Method: A retrospective chart review was conducted on 42 patients who met the inclusion criteria. The collection period was from October 4th 2018- March 20th 2019. Data was recorded from patient records, laboratory and radiological reports. Data was kept in the Bon Secours password protected database with unique identifiers assigned.

Results: A total of 42 patients were studied. The median PFS(Progression Free Survival) and OS(Overall Survival) were recorded. Dose reductions were needed in a number of patients, with neutropenia being the most common reason for dose reduction. Neutropenia was the most common toxicity reported, with a number of patients having low neutrophil counts of grade 1 or higher as per the Common Toxicity Criteria for Adverse Events (CTCAE), version 4. No patient experienced febrile neutropenia. Gastrointestinal upset, fatigue, altered liver function, and rash were reported in patients also.

Conclusion: The toxicity profile of palbociclib seen in this real-world experience mirrors that described in the clinical trials with this agent. No new or unexpected toxicities were encountered. As expected, neutropaenia was the most common adverse event but this was generally asymptomatic and was managed with dose reductions. Prolonged disease control was seen with the combination of palbociclib with endocrine therapy.
Cohort Profile: Mitchelstown Cohort Rescreen Study

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Background & Objectives: Noncommunicable diseases (NCDs) have a significant impact; accounting for over 70% of deaths worldwide. The majority of NCDs are made up of type 2 diabetes, cardiovascular disease, chronic respiratory diseases and cancer. Many NCDs share several common preventable risk factors. Having up-to-date measurements of these risk factors allows public health specialists to be most informed about NCDs.

Materials & Methods: A cross-sectional study design was utilised for the Mitchelstown cohort rescreen study following on from the 2011 screening. Participants from 2011 were invited to the rescreening, of which 1378 agreed to do so (response rate: 76%). Individuals aged between 55 and 79 years underwent assessments such as blood measurements, lipid profiles, body composition via bioelectrical impedance and anthropometric measurements and accelerometer measured physical activity. The collection of descriptive statistics was the primary aim of this study. Two multivariable logistic regressions were carried out with hypertension and type 2 diabetes as dependant variables.

Results: The proportion of smokers decreased between 2011 to 2016. Physical inactivity increased over the 5-year period, which may be confounded by aging. Age, BMI and cholesterol parameters were found to be strongly correlated with an individual being hypertensive. Sex, self-perceived health rating and BMI were found to be associated with type 2 diabetes.

Conclusions: From our analyses, many common risks factors related to NCDs such as BMI and cholesterol parameters which should be heavily targeted. Designing public health campaigns that are comprehensively informed on proximal risk factors is essential for maximum impact.
Lipid Identification Using High Resolution MS\textsuperscript{e} and Triple Quadrupole Mass Spectrometry: A Critical Step in Lipid Biomarker Discovery

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Liquid chromatography-mass spectrometry (LC-MS) is a popular platform for untargeted lipidomic biomarker discovery. Output generated from a discovery project typically includes a mass to charge ratio (m/z), a chromatographic retention time, a chemical formula and a list of possible identifications. Correctly identifying the lipid is a challenge, as there are many possible combinations of lipid side chains for any given m/z and formula. Herein, we describe a method for lipid identification and characterisation of putative lipid biomarkers on Waters SYNAPT G2-S quadrupole time-of-flight and Waters Xevo TQMS triple quadrupole mass spectrometers, both fitted with ACQUITY ultra-performance liquid chromatography (UPLC\textsuperscript{TM}) systems. Briefly, data processed with MassLynx\textsuperscript{TM} V4.1 (Waters Corp.) from MS\textsuperscript{e} high resolution analysis, which fragments parent MS\textsuperscript{1} ions to produce product MS\textsuperscript{2} ions, can pinpoint characteristic fragments associated with a particular lipid class or side chain which narrows the number of identification possibilities. Further confirmation of the lipid identity may be performed using multiple reaction monitoring (MRM) on a triple quadrupole mass spectrometer and processed with MassLynx\textsuperscript{TM} V4.1. Unlike an untargeted method which includes all ions, an MRM experiment only targets the parent ions of compounds of interest and reduces background ion interference. These parent ions are fragmented with optimised cone voltage and collision energy values to enhance the signal of the characteristic product ions, and retention times are matched to the original MS\textsuperscript{e} analysis to ensure the correct compound has been identified. The procedure is demonstrated here to identify a phosphatidylcholine extracted from plasma.
Chronic intermittent hypoxia lowers *Lactobacillus rhamnosus* relative abundance and increases apnoea index and blood pressure: Effects of prebiotic supplementation

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Evidence is accruing to suggest that microbiota-gut-brain signalling plays a regulatory role in cardiorespiratory physiology. Chronic intermittent hypoxia (CIH), modelling human sleep apnoea, affects gut microbiota composition and elicits cardiorespiratory morbidity. We determined if treatment with prebiotic fibres ameliorates cardiorespiratory dysfunction in CIH-exposed rats.

Adult male rats were exposed to CIH (96 cycles/day, 6.0% O₂ at nadir) for 14 consecutive days with and without prebiotic supplementation (fructo- and galacto-oligosaccharides) beginning two weeks prior to gas exposures.

CIH increased apnoea index and caused hypertension. CIH exposure altered the gut microbiota, predominantly decreasing the relative abundance of *Lactobacillus rhamnosus* and increasing the relative abundance of pathogenic species. Faecal short-chain fatty acid (SCFA) concentrations, plasma and brainstem pro-inflammatory cytokine concentrations as well as brainstem neurochemistry were unaffected by exposure to CIH. Prebiotic administration modulated gut microbiota composition and diversity, increasing faecal SCFA concentrations, but did not recover CIH-induced reductions in *Lactobacillus rhamnosus* or prevent adverse CIH-induced cardiorespiratory phenotypes. CIH-induced cardiorespiratory dysfunction is not critically dependent upon decreased gut SCFA concentrations. Prebiotic-related boosting of SCFAs was not sufficient to prevent CIH-induced apnoea and hypertension in our model. We identified associations between multiple gut bacterial species and blood pressure. CIH-induced cardiorespiratory and autonomic dysfunction may relate to an aberrant gut microbiota signature contributing to maladaptive plasticity in the neural circuitry controlling respiratory and autonomic homeostasis. Our findings have relevance for human sleep-disordered breathing and contribute to an emerging interest in the manipulation of the gut microbiota as an adjunctive therapy for human cardiorespiratory disease.

Funding: Department of Physiology and APC Microbiome Ireland, University College Cork, Ireland.
How should an exercise programme be designed to meet the needs of people with neurological conditions?

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Background: Historically, exercise programmes for people with neurogocial conditions have had limited success, suggesting that the needs of participants were not fully met. The aim of this study was to explore the exercise needs of people with neurological conditions, identifying factors that influence exercise participation and the features of an exercise programme which could overcome participation barriers.

Methods: This was a mixed methods study with sequential design. A purposeful sample of people with stroke or Parkinson’s Disease was recruited. A questionnaire aimed at exploring exercise needs and service preferences was devised, distributed and analysed using descriptive statistics. Following this, semi-structured interviews on similar topics were conducted until saturation was reached, and subsequently analysed using thematic analysis.

Results: Data from 40 questionnaires (62% response rate) and 12 interviews were analysed.

A number of barriers to participation were identified, particularly lack of motivation (85%, n=33) and symptoms of a health condition (70%, n=25). Analysis of interview data confirmed these barriers, and highlighted the complex nature of exercise influencers. The purpose of the exercise activity was further identified as an additional participation influencer.

Integration of questionnaire and interview analyses enabled an optimal programme design model to be developed. This incorporates core features, namely being group-based, in a protected space, with a trained instructor, and a firm-flexi structure (structured but some flexibility in attendance), and key success features, namely the instructor-participant relationship, conducive environment and adaptability.

Conclusion: Many factors influence exercise participation in people with neurological conditions. A programme model which best meets the needs of people with neurological conditions is proposed, identifying key participation-enabling features.
Assessment of Platelet Activation Status and Platelet Reactivity in Multiple Myeloma, Smouldering Myeloma and MGUS Patients.

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Introduction: Thrombotic events are reported in up to 10% of patients with Multiple Myeloma (MM), Smouldering Myeloma (SM) and the premalignant disorder, monoclonal gammapathy of undetermined significance (MGUS). Platelet dysfunction is a feature of this thrombotic risk thought to arise from both the disease state and associated treatment regimens including dexamethasone, Thalidomide, Lenalidomide and proteasome inhibitors ¹². Platelet hyperactivity and the influence of circulating paraprotein levels on platelet activity is investigated in MM, SM and MGUS patients and healthy controls pre and post anti-myeloma and anti-coagulant treatment in this study.

Methods: Platelet fibrinogen receptor activation (PAC-1), granule release (CD62P, CD63), phosphatidylserine exposure (Annexin V) and Platelet-Leucocyte Aggregates (CD61/CD45) were assessed by flow cytometry at baseline and following treatment. Platelet reactivity in response to ADP and TRAP-6 were assessed by flow cytometry. Platelet production was examined by quantification of reticulated platelets. The influence of paraprotein levels on platelet activity was investigated by assessing thrombus formation using an in-vitro flow cell assay and by assessing paraprotein coating of platelets.

Results: Results indicate that platelets are hyperactivated in MM patients and in premalignant SM and MGUS patients. Hyperactivity appears maintained during treatment. Platelet reactivity in patient groups however appears similar to controls. A greater proportion of immature platelets were present during treatment and platelet-immunoglobulin complexes were detected in a subset of patients.

Conclusion: Characterisation of platelet dysregulation due to the disease state and anti-myeloma therapies may guide management of thrombotic risk and highlight alternative therapeutic targets in the prevention of myeloma associated thrombosis.
An observational study of the utility of BRAF and MEK inhibitor targeted therapy in metastatic melanoma patients in a regional cancer centre

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Introduction: Trametinib (MEK inhibitor) combined with Dabrafenib (BRAF inhibitor), targeted therapy for BRAF mutated metastatic melanoma, was introduced in Ireland in 2012. The clinical outcomes of these drugs have not been evaluated in an Irish population.

Methods: A retrospective chart review of all patients (n=41), treated with Dabrafenib alone or in combination with Trametinib from May 2012 to September 2018 was carried out. Clinicopathologic variables were recorded. Treatment outcomes were measured using progression free survival (PFS), overall survival (OS) and objective response rates (ORR).

Results: The ORR among all patients was 82.9%, 12% of patients achieved a complete response. When patients with brain involvement (n=12) were removed, the median PFS was 12.35 months (95% CI 0.42 to 24.280) and median OS was 18.19 months (95% CI 13.412 to 22.968). 39% of patients experienced grade 3 or greater of a side effect, necessitating a dose reduction. The median PFS of patients who experienced side effects was 12.29 months (95% CI 4.045 to 20.535) versus 5 months (95% CI 2.215 to 7.785) in patients who didn’t experience side effects (p=0.003). The median PFS for patients who had their dose reduced due to side effects was 16.55 months (95% CI 0.426 to 32.674) versus 5.520 (95% CI 3.972 to 7.068) in those whose doses remained the same (p=0.024).

Conclusion: The median OS of 18.19 months in patients without brain metastases is lower than the clinical trials median of 25.6 months. This is likely due to our heterogenous population. Our ORR of 82% was higher than the rate reported internationally. Our results highlight a statistically significant relationship between toxicity and PFS. These findings may impact clinical practice.
Use Of Biologics In Older Patients With Inflammatory Arthritis

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Background: Biologics are a key component of the treatment armamentarium for inflammatory arthritis (IA). Questions remain surrounding the prescription, efficacy and safety of biologics in the older population. This study aims to describe the use of biologics in older patients with IA and compare it to younger patients.

Method: This was a retrospective cohort study of patients with a diagnosis of IA who were receiving a biologic. Data was collected from medical charts at rheumatology outpatient clinics. Patients were divided into two groups: age 45 – 65 and >65.

Results: Each group had 30 patients. 8 different biologics featured; 87% of younger and 80% of older patients were prescribed the standard dosage. The incidence of biologic discontinuation due to drug ineffectiveness was the same (16%). 1 older patient had a biologic discontinued due to a serious adverse event. Infections requiring hospitalization were not common (n=5) but were more frequent amongst older patients (n=4). 8 patients had active disease, and these were mainly older patients (n=6). 47% of younger and 60% of older patients received concomitant therapy; those who received a steroid (n=9) were more likely to be older (n=7).

Conclusion: Biologic prescribing was similar between both groups with regard to dosage administered, but there were differences in the types of biologics prescribed to each group. Rates of significant infection were low overall, however they were more prevalent amongst the older population. More older patients had active disease, and more were prescribed concomitant steroid therapy, which may represent under-dosing of biologic therapy in this older cohort.
Does adolescent exposure to a cafeteria-diet potentiate the effect of neuroinflammation on memory during adulthood in rats?

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Overconsumption of high energy diets rich in saturated fat and sugar (cafeteria-diet) leads to an increased prevalence of obesity, metabolic disorders and memory impairments and is thus a major health concern in developed countries. Adolescence is a critical period of development of plasticity-driven neural circuits in the hippocampus and associated learning and memory function. The hippocampus is particularly susceptible to the pro-inflammatory cytokine interleukin-1\(\beta\) (IL-1\(\beta\)), with elevated levels in adulthood implicated in memory and stress-related disorders. The aim of this study was to investigate whether consumption of a cafeteria diet during adolescence induces memory, inflammatory and metabolic impairments in adulthood, and whether it potentiates the negative effect of IL-1\(\beta\) on memory during adulthood. We fed male Sprague Dawley rats with a cafeteria diet during the adolescent period (P28 – P56). At P56 (early adulthood) a lentivirus causing overexpression of IL-1\(\beta\) was injected into the hippocampus and allowed to overexpress IL-1\(\beta\) for six weeks to induce chronic neuroinflammation. Hippocampal-associated behaviours (recognition and contextual memory) were carried out three weeks after viral integration. The impact of the cafeteria-diet during adolescence on adult metabolism, inflammation and hippocampal neuroplasticity has been assessed by measuring the levels of hormones (insulin, leptin, adiponectin), and inflammatory cytokines (IL-1\(\beta\), IL-6, TNF-a) in the circulation, and the expression of plasticity markers (synaptophysin, PSD95, BDNF) in the hippocampus. Our data suggest that cafeteria-diet during adolescence does not induce impairments in hippocampal-cognitive performance in adulthood despite negatively affecting peripheral metabolic parameters in adulthood.
Comparing timing of referrals to a community palliative care service between patients with haematological malignancies, solid tumour malignancies and non-malignant conditions.

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Background: Community palliative care services provide support for patients with life-limiting illness to remain at home. Early integration of palliative care is recommended but this is not always the case in practice. We assessed referrals to a community palliative service to look for differences in the timing of referrals for patients with malignant versus nonmalignant diagnoses, with a particular interest in patients with haematological malignancies.

Methods: This was a retrospective chart review of all patients referred to a community palliative care service over a six month period. Time from referral to death was the primary outcome. Results were analyzed with SPSS software to create survival curves and compare outcomes. Patient demographics, presence of comorbidities and place of death were also recorded.

Results: 442 patients were included in this study. 17 (4%) had haematological malignancies, 273 (62%) had solid tumour malignancies and 152 (44%) had non-malignant conditions. Haematological malignancies had the longest survival times, with a mean survival of 99 days, compared to solid tumour malignancies and non-malignant conditions, mean survival 75 days and 39 days respectively (P=<0.001).

Conclusion: Haematological malignancies represented a small percentage of referrals but had the longest survival times. Non-malignant conditions had the shortest survival times. Research has shown that physicians can be reluctant to refer to palliative services when disease trajectory is difficult to predict, such as in non-malignant disease. This could represent an opportunity for further education to encourage earlier integration of palliative services into patients’ care.
Assessment of the reproducibility of Ki67 (MIB1) for assessment of proliferative fraction in non-Hodgkin lymphomas

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Introduction: Ki67 is widely used to assess proliferative fraction of neoplasms, particularly in grading of neuroendocrine tumours. It is also used in lymphomas, both for diagnostic and prognostic purposes, but its interobserver reproducibility is poorly defined in this context.

Aim: To assess reproducibility of Ki67 scoring in mantle cell lymphoma (MCL), follicular lymphoma (FL) and DLBCL among raters with variable experience, both in rapid visual estimate (VE) under the microscope and formal manual counting (MC).

Method: A H&E and Ki67 slide was retrieved from files from 50 lymphomas cases (8 MCL, 21 DLBCL, 21 FL). Each participant (3 medical students, 3 trainee pathologists, 3 consultant pathologists) provided a VE of the percentage of Ki67-positive neoplastic cell nuclei in each case, and several participants provided an MC of percentage positive nuclei from a printed photomicrograph. Interobserver reproducibility was calculated for each method using the Intraclass Correlation Coefficient (ICC).

Results: The ICC for VE, calculated between 9 raters, was poor overall (0.561), and varied between tumour types (FL 0.415; DLBCL 0.504; MCL 0.599) and level of experience (medical students 0.715; trainee pathologists 0.680; consultants 0.827). The ICC for MC was good (0.897), calculated between 4 raters, and also varied between tumour types: FL 0.897; MCL 0.844; DLBCL 0.726. Intraobserver reproducibility between VE and MC ranged from 0.401 to 0.834.

Conclusions: VE is poorly reproducible for estimation of Ki67 index in lymphoma. Pathologists should consider MC, particularly for FL cases, and should not delegate responsibility for VE to less experienced members of staff.
Bioinformatic analyses of an RNA sequencing dataset to identify breast cancer-associated long, non-coding RNAs

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Breast cancer research has traditionally centred on genomic alternations, hormone receptor status and changes in cancer-related proteins to provide new avenues for targeted therapies. Due to advances in next generation sequencing technologies, there has been the emergence of long, non-coding RNAs (lncRNAs) as regulators of normal cellular events, with links to various disease states, including breast cancer. Here we describe our bioinformatic analyses of a previously published RNA sequencing (RNA seq) dataset to identify lncRNAs with altered expression levels in a subset of breast cancer cell lines.

Using an RNA seq dataset of 675 cancer cell lines, (Klijn et al. Nature Biotechnology, 2014), a subset of 18 cell lines was selected for our analyses that included 16 breast cancer lines, one ductal carcinoma in situ line and one normal-like breast epithelial cell line. Principle component analysis demonstrated correlation with well-established categorization methods of breast cancer (i.e. luminal A/B, HER2 enriched and basal-like A/B). Through detailed comparison of differentially expressed lncRNAs in each breast cancer sub-type with normal-like breast epithelial cells, we identified ten lncRNAs with consistently altered expression, and four of those were associated with invasive breast cancer using data from The Cancer Genome Atlas (TCGA). Lastly, we determined the relative expression level of several lncRNAs experimentally confirm the findings of our bioinformatic analyses.

Overall, we show that use of existing RNA seq datasets, if re-analysed with modern bioinformatic tools, can provide a valuable resource to identify lncRNAs that could have important biological roles in oncogenesis and tumour progression.
Patterns of Multimorbidity within a patient population referred to Community Palliative Care services in Cork – A Retrospective Cross Sectional Study

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Long term illnesses pose challenges to our health care system which is largely configured to deal with individual diseases rather than multimorbidity. Multimorbidity, commonly defined as the presence of two or more chronic medical conditions in an individual, is associated with functional decline, decreased quality of life, and increased healthcare utilisation, including emergency admissions. We examined the distribution of comorbidity and multimorbidity of physical and mental health disorders in relation to age, socioeconomic deprivation and performance status in a Palliative care community cohort.

In this retrospective cross sectional study we reviewed all patients referred to community palliative care services in Marymount University Hospital and Hospice from 1st January to 31st December 2018. We analysed the data according to the number of morbidities, disorder type, sex, age, social deprivation score, palliative performance scale and referral origin.

Nearly all of patients in the community palliative care cohort were multimorbid. Unsurprisingly the number of morbidities increased with advancing age. The degree of multimorbidity and performance of the patient at referral gives the clinician an insight into the patients future care needs and the resources required within the community to provide this care. This enables us to better resource our community service and also identify areas to optimise health promotion within our patient cohort.
The Impact of Chronic Hypertension and Antihypertensive Treatment on Adverse Maternal and Feto-neonatal Outcomes: A Systematic Review and Meta-analysis

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Introduction: Chronic hypertension complicates up to 5\% of all pregnancies and several studies have linked it with adverse pregnancy outcomes. Even though antihypertensive treatment during pregnancy reduces the risk of severe hypertension, its effects on other perinatal outcomes is largely unknown.

Objective: To conduct a systematic review and meta-analysis of observational studies that assessed the effect of chronic hypertension and antihypertensive treatment on the risk of adverse perinatal outcomes.

Methods: Medline/PubMed, EMBASE, and Web of Science were searched based on the following criteria: 1.Population: pregnant women; 2.Exposure: chronic hypertension/antihypertensive treatment; 3.Comparator: normotensive women/women not on antihypertensive treatment; and 4.Outcomes: pre-eclampsia (PE), preterm birth (PTB), stillbirth and small for gestational age (SGA).

Two reviewers independently assessed the eligible studies, extracted the data and assessed the studies’ quality. Random effects models were used to pool crude and adjusted odds ratios (ORs), all analyses were performed using RevMan 5.3.

Results: Of the 14,306 citations, 124 studies met the inclusion criteria. The risk of adverse perinatal outcome was higher among women with chronic hypertension: PE [21 studies; adjusted OR: 5.43 95\% confidence interval (CI), (3.85, 7.65)]; stillbirth [18 studies; aOR: 2.32 (2.22, 2.42)] and SGA [24 studies; aOR: 1.96 (1.61, 2.40)]. Antihypertensive treatment was significantly associated with SGA compared to both healthy and hypertensive controls, but it has no significant effects on PE, PTB or stillbirth when compared to untreated hypertensive women.

Conclusion: Women with chronic hypertension have increased risk of adverse perinatal outcomes. Although antihypertensive treatment shows little or no effects for some adverse perinatal outcomes, it may have negative effects on fetal development.
Comparing the relative accuracies of Magnetic Resonance Imaging versus Ultrasound as measurements of prostate volume

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Introduction: Prostate volume (PV) is an important measurement in urology and influences patient management. Accurate PV measurement is therefore essential. This study aims to compare the accuracy of magnetic resonance imaging (MRI) to transrectal ultrasound (TRUS) as measurements of PV.

Methods: This retrospective database study examined 272 men who had entire prostates removed via radical prostatectomy between 2012 and 2018 (inclusive) in the Bon Secours Cork. MRI and TRUS preoperative measurements of PV were assessed, and compared to two controls intended to simulate PV in vivo. One control (“pathological volume”) was derived from pathology reports following radical prostatectomy. This measurement is taken hours after surgery, but better reflects controls in existing literature. The second control (“postoperative volume”) involves measurements taken in theatre directly after prostatectomy, supposedly better representing PV in vivo.

Results: Using “pathological volume” as control, MRI more accurately estimated PV in 57.63% of cases (n=236). Using “postoperative volume” as control, MRI was more accurate in 73.08% (n=182). The correlation coefficient between MRI and “pathological volume” was r=0.7649. This rose to r=0.8640 between MRI and “postoperative volume.” The correlation coefficient between TRUS and “pathological volume” was r=0.7883. This decreased to r=0.7654 between TRUS and “postoperative volume.” The mean difference between MRI and TRUS measurements was 8.8567ml (95%CI 7.3082–10.4051) (n=247). The mean difference between controls; “postoperative” and “pathological” was 5.5819ml (95%CI 3.9618–7.2020) (n=198).

Conclusion(s): MRI was more accurate than TRUS in most PV assessments. While this was regardless of control, MRI was even more accurate when “postoperative volume” was the control.
The Implication of BRAF mutation in Advanced Colorectal Cancer

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Introduction: Colorectal cancer (CRC) is a lethal disease with heterogeneous outcomes. BRAF is a key driver mutation in CRC and is involved in deregulation of the MAPK pathway. While international studies have correlated BRAF status with poor prognosis, this has never been studied in an Irish population. Identification of a mutation predicting poor prognosis would have significant implications for CRC management.

Aim: To compare the natural history of patients with BRAFMUT CRC with a control sample of patients without BRAF (BRAFWT wild-type).

Methods: A retrospective observational analysis of advanced CRC patients with known BRAFMUT was conducted. BRAFMUT patients were identified from the CUH histopathology database. Controls with known BRAFWT were randomly selected from the database. Demographic characteristics and clinicopathological data were recorded. Survival was assessed with Kaplan-Meier / Cox proportional hazard models.

Results: 21 patients were BRAFMUT and 35 with BRAFWT were studied. BRAFMUT were more likely female (75% vs 33%, p=0.007) and right-sided (65% vs 31.4%, p=0.033). Median overall survival was lower in BRAFMUT group [17.3 months (95% CI: 0-40.8)] compared to patients with BRAFWT [median survival not reached, log rank p=0.001]. On multivariate analysis BRAFMUT was independently associated with an increased risk of mortality (HR 12.76 (95% CI: 3.15-51.7), p<0.001).

Conclusion: BRAFMUT colorectal cancer was associated with significantly reduced overall survival. Knowledge of this mutation is now standard of care and should dictate management. Surgeons should be aware of this genetic signature as the natural history of the disease may mitigate against an aggressive surgical strategy.
Regulation and Function of the E2 ubiquitin conjugating enzyme Ubc6e

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ER associated degradation (ERAD) of misfolded proteins is an important component of the cellular Unfolded Protein Response (UPR). It involves ubiquitination of target proteins and their translocation to the cytosol for degradation by the proteasome.

The ubiquitin conjugating enzyme Ube2j1 is a central component of the ERAD pathway. It is phosphorylated at Serine 184 in response to p38 MAP Kinase signalling, but apart from increasing its association with the E3 ligase cIAP1, the functional implications of this modification are not yet clear. Recent studies in our lab now showed that B-Raf which regulates many important cellular processes and it is mutated forms (mostly Brafv600e) are responsible for the majority of human melanomas can also phosphorylate Ube2j1. This occurs primarily at Serine 184, however, our studies indicate an additional modification at an as yet unknown site. We developed PTET7-Braf-V600E-GFP plasmid and the expression where optimised in a dose- and time-dependent manner. Studies are ongoing to characterise the nature of this modification and to develop an experimental model that will support FPLC purification of adequate material to allow for Mass-Spectrometry analysis.

A small number of Ube2j1 substrates have been identified, including the Herp1 protein, which is known to act as a negative regulator of autophagy. Our studies now suggest that p62, which acts to shuttle ubiquitinated proteins to autophagosomes, may also be regulated by ube2j1. We are currently exploring this, and assessing a possible role for phosphorylation by p38 and B-Raf MAP Kinase pathways.
Management of Older Surgical Patients; Is There a Role for Geriatric Medicine?

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Introduction: There is growing awareness of the need for geriatric medicine input in the management of older surgical patients. These patients are often frail and at risk of perioperative complications. Medication management is a key component of geriatric medicine, as is advance care planning. We audited prescribing and documentation of advance care discussions for older surgical patients admitted to the general surgical ward of our hospital.

Methods: A point in time audit was conducted. All surgical patients on the general surgical ward over the age of 65 were included. Medication charts were reviewed to assess for polypharmacy (defined as 4 or more medications), psychotropic and opiate prescribing. Anticholinergic burden (ACB) score was recorded for all patients. Medical charts were reviewed to evaluate documentation of advance care discussions.

Results: 32 patients were included. Average age was 76.6 years. Mean number of medications per patient was 8.2, with 87.5% (n=28) experiencing polypharmacy. 78% (n=25) were prescribed at least one opiate, with Tapentadol the most frequently prescribed. Psychotropic medications were prescribed for 19% of patients. ACB score of 3 or more was recorded in 12.5% (n=4) of patients. One patient had an advance care discussion documented.

Conclusion: Polypharmacy was very prevalent among this patient population and opiates were widely used. ACB score greater than 3 represents an increased risk of cognitive impairment and mortality. Despite many patients having significant comorbidities advance care discussions were rare. These patients would benefit from the involvement of geriatric medicine in terms of medication rationalisation and advance care planning.
Polypharmacy in the elderly with Rheumatic Disease: Use of the STOPP/START criteria to evaluate polypharmacy in the >65 population with Rheumatic Disease

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Polypharmacy among the elderly population is a well-documented problem. The practice has been associated with potentially inappropriate medications (PIMs), adverse drug events (ADEs) and hospitalization.

1) Quantify polypharmacy in the elderly population with rheumatic disease

2) Determine PIM rate in this group using the STOPP/START criteria (Screening Tool of Older Persons’ Prescriptions/ Screening Tool To Alert doctors to Right Treatment)

3) Determine and compare ADE rate between PIM positive and negative groups

All patients who were >65, had a diagnosed rheumatic disease and were attending rheumatology out-patient department in Cork University Hospital were included in the study. Patients’ medication lists, specific rheumatic disease, laboratory findings and comorbidities were obtained from their charts and were screened for IPs using the STOPP/START criteria and possible ADEs using the WHO-UMC criteria.

70 elderly patients were studied. The prevalence of polypharmacy was 94%. The median (IQR) number of regular prescription medications was 7 (2-16). PIMS were recorded in 43 (61%) of patients. Increasing numbers of medications was a significant risk factor for PIMs (p=0.0027). ADEs were detected in 18 (26%) of patients. The ADE detection rate in PIM positive patients was 35% (15/43) and 10% (3/27) in PIM negative patients. A patient who is PIM positive has a statistically significant risk of having an ADE (p=0.47).

There is a high prevalence of polypharmacy amongst the elderly population with rheumatic disease in Cork University Hospital. Increasing numbers of medications is statistically associated with increased number of PIMs and ADEs.
Regional and developmental timing profile of hippocampal neuroplasticity in adolescence: lessons from animal studies.

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Adolescence is a time of great change for humans due to social, psychological and physical changes. It is during this time that the brain undergoes changes which will have effects for the lifecycle of the individual. The hippocampus is a key brain structure in the changing architecture due to its involvement in learning, memory and neuroplasticity. By using laboratory animals, we can better understand the developmental trajectory of adolescent development.

Hippocampus samples were collected at post-natal day (PND) 28, 42 and 56 from male and female Sprague-Dawley rats. These age profiles in the rat are approximations for early, mid and late adolescence/emerging adulthood. Using mass spectrometry, these samples were analysed for differential protein expression.

A Data Dependent Acquisition (DDA) methodology was employed on a Thermo-Scientific Q-Exactive quadrupole mass spectrometer. Data was processed using the MaxQuant and Perseus software suites. From the samples, 1,128 proteins were identified. Significantly expressed proteins were detected between age groups across development. No main effect or interaction was found for age or sex. Using the String database, these proteins were organised into networks showing the links between proteins and the biological processes these proteins are implicated in such as neurogenesis, neuroplasticity and adolescent development.

This study has added to our understanding of the underlying changes in the brain during adolescence using the changes in protein expression to achieve this. Further study is needed to map the links between the proteins and the developmental timing across the adolescent period.
Factors associated with lower knowledge of HIV and STI transmission, testing & treatment among Men who have Sex with Men (MSM) in Ireland – Findings from the MSM internet survey Ireland (MISI) 2015

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Background: Poor knowledge regarding HIV/STI transmission, testing and treatment among MSM may be contributing to their disproportionately high risk of STIs/HIV. However, a lack of research exists in regard to which MSM have the lowest levels of knowledge.

Aim: The aim of this study was to compare MSM who had lower knowledge of HIV and STI transmission, testing, and treatment with MSM who did not, and to identify factors predisposing them to having lower knowledge levels.

Methods: The MSM Internet Survey Ireland 2015 was a self-completed online national survey available to all MSM living in Ireland. Thirteen standardised factual statements assessed participants’ knowledge of HIV/STI transmission, testing and treatment. Respondents were defined as having lower knowledge if they indicated prior knowledge of 10 statements or fewer out of 13. Multivariable-adjusted logistic regression was used to identify factors associated with having lower knowledge.

Results: 2905 MSM were included in this study. Thirty-six percent of MSM had lower knowledge of HIV/STI transmission, testing and treatment. The factors associated with lower knowledge included being aged 18-24, living in Dublin and being born outside Ireland. Lower knowledge was also observed among those out to fewer/none of their contacts, those who never tested for HIV and among MSM who never visited the Man2Man website.

Conclusions: A range of demographic factors, sexual health characteristics and use of a targeted health promoting website are associated with knowledge levels of HIV/STI transmission, testing and treatment in MSM. Further targeted interventions may have potential public health benefit for MSM.
Biochemical characterisation the protein-protein interactions of human RNA-binding protein, SMAUG1.

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RNA-binding proteins are involved in regulating every step of gene expression, and their dysfunction, abnormal expression and/or mislocalisation have frequently been implicated in human diseases, including neurodegeneration. This work focuses on SMAUG1, one of two human paralogs of Drosophila Smaug RNA-binding protein. While its role as a translational repressor in Drosophila is well established, SMAUG1’s role in humans remains largely unexplored. Still, previous studies have linked SMAUG1 to Alzheimer’s disease and muscular dystrophy.

To better understand the underlying biology of SMAUG1 in humans, we identified candidate SMAUG1 protein interactors. Four members of the 14-3-3 protein family, β/α, γ, η and ζ, were of particular interest. Co-immunoprecipitation with myc-tagged 14-3-3 ζ successfully confirmed an interaction with SMAUG1 in vitro. We also have preliminary evidence that SMAUG1 is phosphorylated. Using the ANnotation and Integrated Analysis (ANIA), we identified three serine residues at positions 254, 580 and 665 in the amino acid sequence of SMAUG1 that are potential phosphorylation sites. We have created a series of serine-to-alanine mutations in these positions, to explore the relationship between SMAUG1 phosphorylation and 14-3-3 binding. To examine SMAUG1’s cellular distribution, we tagged the protein with green fluorescent protein (GFP) and observed aggregate formation. Interestingly, aggregation was eliminated upon co-expression with 14-3-3γ. As the formation of RNA/protein granules is a hallmark of many neurodegenerative diseases, we believe the interaction of SMAUG1 with 14-3-3 could be important in the phase separation displayed by these particles.

Overall our observations provide an important groundwork for understanding some of the protein-protein interactions of SMAUG1 and how those interactions could impact human health and disease.
### Appendix 1

**RPAC Committee Members**

<table>
<thead>
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Appendix 2

RCPI CPD approval

CPD Approval
Live Educational Event (LEE)

Title: New Horizons Research Conference

Reference: 8761

Date: Thursday 5 December 2019

Organised By: School of Medicine University College Cork

Approved Date: Monday 18 November 2019

This Live Educational Event attracts the following number of CPD Credits in the External CPD category: 5

Important information:

Approval:
- This approval applies solely to this instance of the Live Educational Event and cannot be carried forward or applied to any other activity.
- Approval for this instance of the Live Educational Event does not guarantee approval for future instances of this event.
- You must seek approval for other instances on a case by case basis.
- Approval of this event for CPD does not imply accreditation of the event or the providers, or a participating doctor’s competence.

Audit
This Live Educational Event may be randomly selected for audit. If your event is selected, we will inform you in good time prior to the event.

Evidence of Attendance:
- This document certifies that the Live Educational Event has been approved for CPD. It is NOT evidence of attendance.
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- Name of Attendee - It is not appropriate to distribute certificates without first entering the attendee’s name.
- The attendance certificate must include the following statements
  - “This CPD recognition is accepted by all Irish Postgraduate Training Bodies”
  - “1 CPD credit is equivalent to 1 hour of educational activity”