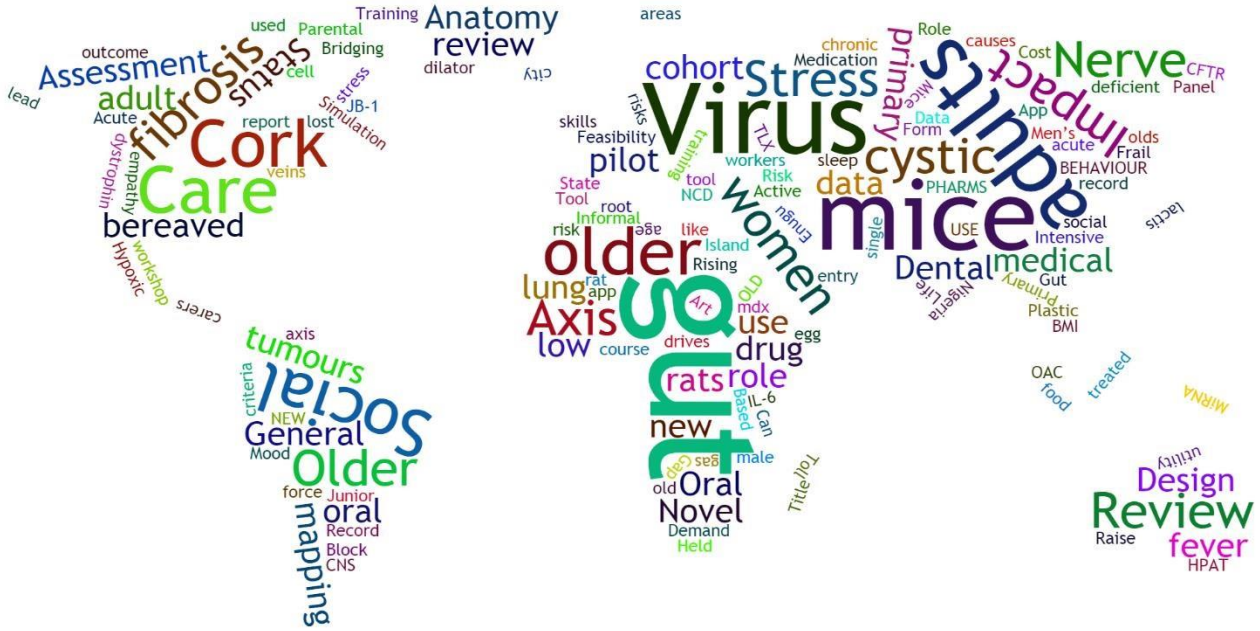
8th December 2016

New Horizons in Medical Research

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

Main Atrium, Western Gate Building, University College Cork



UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

New Horizons
Medical Research Conference 2016

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] it is with great pleasure that I welcome you all to the New Horizons Medical Research Conference 2016. 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 program 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. As a result, the event has been awarded 6 CPD points from the RCPI. We hope that all 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 extent its gratitude to our colleagues who chaired the sessions, presented at the conference and who participated in judging the oral and poster presentations:

Dr Orla Barry
Professor Geraldine Boylan
Professor Colin Bradley
Professor Noel Caplice
Dr Patricia Fitzgerald
Dr Collette Hand
Dr Patrick Harrison
Professor Mary Horgan
Professor Jonathan Hourihane
Dr Niall Hyland
Dr John MacSharry
Dr Yvonne Nolan
Dr Olivia O'Leary
Dr Dervla O'Malley
Dr John O'Mullane
Dr Kathleen O'Sullivan
Dr Colm O'Tuathaigh
Dr Mark Rae
Dr Gabriella Rizzo
Dr Suzanne Timmons
Dr Elaine Walsh

Yours sincerely,

Dr Liam Fanning
Chair, School of Medicine Research & Postgraduate Affairs Committee, UCC
https://www.ucc.ie/en/medical/research/committee/rpaccommitteemembers/

Time	New Horizons 2016 WGB G.05 Schedule of Events
8.00 a.m.	Free registration
8.00 a.m.	Hanging of posters in the main atrium WGB
8.55 a.m.	**Welcome Address:** Dr Liam Fanning, Chair, School of Medicine Research & Postgraduate Affairs Committee, UCC
	Session 1
	Chairs: Professor Colin Bradley & Dr Kathleen O'Sullivan
9.00 a.m.	*Professor Geraldine Boylan:* Neonatal Physiology, Department of Paediatrics & Child Health, UCC, Irish Centre for Fetal and Neonatal Translational Research *Baby Brainwaves and Big Data*
	01. Concurrent validity of a Novel touchscreen based assessment tool for measuring cognitive development in toddlers: the Babyscreen app. *CE Ahearne et al* 02. Malnutrition in hospitalised older adults: A multicentre observational study of prevalence, associations and outcomes. *E O Shea et al* 03. The 'Smart' Needle – A Needle Integrated with an Impedance Sensor for Objective Nerve Localisation during Ultrasound Guided Peripheral Nerve Block. *L Helen et al*
9.55 a.m.	*Professor Jonathan Hourihane,* Department of Paediatrics & Child Health, UCC Emerging Strategies for Prevention and Treatment of Food Allergy
	04. Malnutrition and body composition predicts quality of life and survival: a cross sectional study of 880 ambulatory oncology patients. *L Daly et al* 05. Lentiviral overexpression of interleukin-1β in the hippocampus induces neurogenesis-associated cognitive deficits in touchscreen learning paradigms. *CM Hueston et al* 06. Profile of Suicides during Economic Recession and Recovery: A Comparison using Coroners' Records in Ireland. *D Leahy et al*
10.50 a.m.	COFFEE and Viewing of Posters in Western Gateway Building Atrium

	Session 2
	Chairs: Dr Yvonne Nolan & Dr Colm O'Tuathaigh
11.15 a.m.	*Dr Niall Hyland*, Department of Pharmacology & Therapeutics, UCC Influence of the Microbiome on host Gut Function and Physiology
	07. Engineering *Lactococcus lactis* as a protein delivery platform for disease treatment. *B Malone et al* 08. E2 glycoprotein epitope mapping in antibody associated hepatitis C virus. *AS Naik et al* 09. The Diet and Exercise-Microbiome Paradigm: Distinct Functional Profiles of the Athlete Microbiome Revealed by Metabonomic and Metagenomic Analysis. *W Barton et al*
12.05 p.m.	*Dr John MacSharry,* School of Medicine, UCC Exploring the role of the Microbiome in Asthma
	010. A longitudinal investigation into the gut microbiota of people with Cystic Fibrosis (CF) and the effects of an altered gut microbiota on functionality and faecal metabolites as determined by the CFMATTERS study. *F Fouhy et al* 011. Towards a translational understanding of colonic bacteria in Crohn's disease pathology. *K O'Donoghue et al* 012. Preclinical validation of Electrochemotherapy in the treatment of lung tumours. *S Jahangeer et al*
12.55 p.m.	LUNCH and viewing of posters. Poster judging.
	Session 3
	Chairs. Dr Collette Hand and Dr John O'Mullane
2.00 p.m.	*Dr Dervla O'Malley,* Department of Physiology, UCC Neuro-immune and neuro-endocrine signalling in IBS Pathophysiology
	013. The brain ↔ gut axis in Parkinson's disease (PD): Altered gut pathophysiology and increased gut inflammation in the rAAV-α-synuclein rat model of PD. *SM O'Donovan et al* 014. Microbiome and morphology: adult germ-free mice exhibit distinct hippocampal dendritic morphological changes. *S Whelan et al,* Winner *UG Atlantic Corridor Conference 2016*
2.50 p.m.	*Dr Patrick Harrison,* Department of Physiology, UCC CRISPR Cas9 gene editing – engineering cells to model and treat disease
3.05 p.m.	*Professor Noel Caplice,* School of Medicine, UCC Cardiac repair from mouse to man
3.55 p.m.	Prize giving and meeting close: *Professor Mary Horgan, Dean, School of Medicine, UCC*

Keynote speakers, biography and abstract details

SESSION 1:

Professor Geraldine Boylan
Department of Paediatrics & Child Health, University College Cork
"Baby Brainwaves and Big Data"

Professor Geraldine Boylan is Professor of Neonatal Physiology, Department of Paediatrics & Child Health, University College Cork, Ireland and Director of the Irish Centre for Fetal and Neonatal Translational Research – INFANTwww.infantcentre.ie

Geraldine has worked in the area of clinical neurophysiology for many years and since 1996 has worked exclusively in the field of neonatal neurophysiology. She leads the Neonatal Brain Research Group in the INFANT centre – a multidisciplinary research team focused on neurological monitoring of newborns in intensive care, particularly for seizure detection, neonatal encephalopathy, seizure treatment and automated EEG analysis. Researchers in the group, have developed a novel seizure detection algorithm for newborn babies which is currently under clinical evaluation in centres across Europe www.anserstudy.com

For the New Horizons Conference 2016, Geraldine will explore the use of electroencephalography (EEG) for the assessment of newborn brain health and will describe how big data and data analytics is helping to improve our understanding of the newborn brain.

SESSION 1:

Professor Jonathan Hourihane
Department of Paediatrics & Child Health, University College Cork
"Emerging Strategies for Prevention and Treatment of Food Allergy"

Professor Jonathan Hourihane has been Professor of Paediatrics and Child Health in University College Cork, Ireland since 2005. He graduated from Trinity College Dublin in 1987.

He undertook his higher training in Southampton, and London, UK. His primary area of clinical and research interest is in paediatric food allergy and anaphylaxis. He is co-Principal Investigator of the BASELINE, Ireland's only birth cohort study (www.baselinestudy.net.) and the INFANT Research Centre in UCC, and is a founding Board member of the Clemens von Pirquet Foundation.

There has been a revolution in the evidence base for all the allergy prevention advice that health care professionals have been giving Irish mothers. This talk will review the last 20 years of allergy prevention, and the key, game-changing papers published in 2015 and 2016 that will be citation classics for years to come. It will also show how UCC's research focus on the infant skin barrier is at the leading edge in this field and how these two aspects are merging into a genuinely evidence–based integrated preventive strategy."

SESSION 2:

Dr Niall Hyland
Pharmacology & Therapeutics, University College Cork
"*Influence of the Microbiome on host Gut Function and Physiology*"

Dr Niall Hyland is currently researching the role of commensal organisms and putative probiotics on intestinal fluid and electrolyte transport as well as the influence of the innate immune system on gastrointestinal sensation and function. He joined University College Cork in 2007, was appointed to a tenured position as Lecturer in Pharmacology in the School of Medicine in 2008 and holds a Faculty position at the APC Microbiome Institute.

Following his time at Louisiana State University, where his work had direct clinical implications for treatment of gastrointestinal disorders including reflux disease, he completed a Canadian Association of Gastroenterology-supported Fellowship at the University of Calgary. He holds a PhD in Pharmacology from King's College London and has published in leading gastroenterology journals including Gut and Gastroenterology and recently edited the book, The Gut-Brain Axis, Dietary, Probiotic, and Prebiotic Interventions on the Microbiota (Academic Press).

He is on the Steering Committee of the European Society of Neurogastroenterology and Motility, Councillor to the Neurogastroenterology and Motility section of the AGA Institute Council, Member of the British Pharmacological Society's Meetings Committee and Co-chair of the British Pharmacological Society's Systems and Integrative Pharmacology Affinity Group.

Abstract:
Host-microbe interactions have gained considerable attention in recent times with regards to their role in various organic disorders and diseases many of which are characterised by alterations in host gastrointestinal (GI) physiology and function. More microbes are resident in the distal colon than in any other part of the body, and this microbiota has the capacity to influence enteric nerve development, excitability, and GI function. Accordingly, evidence has grown to support the efficacy of probiotics in the management of GI disorders, with both human and animal studies alike demonstrating a positive influence of probiotic bacteria and commensal organisms in disorders associated with either diarrhoea or constipation. Diarrheagenic GI diseases, such as those caused by Vibreo cholera or enterpathogenic Eschericia coli, have well-characterised interactions with the host that explain much of the observed symptoms, in particular severe diarrhoea. However, the mechanisms of action of nonpathogenic bacteria or probiotics on host physiology are less clearly understood. In the context of defining the mechanisms of action of probiotics in vitro and ex vivo, the Ussing chamber has proven to be a particularly useful tool used to define molecular targets for microbes and putative probiotics in the regulation of intestinal secretory and absorptive function. Moreover, germ-free (GF) animals have proven an equally valuable tool in interrogating the communication between microbiota and host.

SESSION 2:

Dr John Mac Sharry
School of Microbiology, University College Cork
"Exploring the role of the Microbiome in Asthma"

Dr John Mac Sharry's research interests are in host-microbe interactions with particular focus on the immune sampling and response in the gut and the lungs. John graduated with a B.Sc. in Microbiology and a Ph.D. in Mucosal Immunology from University College Cork. He worked with Alimentary Health Ltd as Molecular Biology Section head collaborating with several multinational research partners. In 2008 he joined the APC Host Response core as a Post-Doctoral researcher and collaborated on Industrial research with GlaxoSmithKline. John was a guest researcher at the Meakins Christie Laboratories, McGill University in Montreal, Canada as part of an SFI Travel fellowship in 2009 and 2010. John has also lectured and supervised part-time in the CIT. John was appointed in 2013 as a Lecturer in Molecular Microbiology and as Deputy Director of the GEM programme with the School of Medicine, with an affiliation to the School of Microbiology. John in collaboration with Dr Desmond Murphy received a 2015-2016 TRAP award studying the Microbiome in Asthma which he will discuss at the New Horizons 2016 Conference.

SESSION 3:

Dr Dervla O'Malley
Department of Physiology and APC Microbiome Institute, University College Cork, "*Neuro-immune and neuro-endocrine signalling in IBS Pathophysiology*"

Dr Dervla O'Malley carried out her doctoral studies at the University of Dundee prior to undertaking post-doctoral positions in the Universities of Cambridge and Edinburgh. In 2007, she joined the APC Microbiome Institute in University College Cork as a senior postdoctoral scientist and subsequently, the Department of Physiology as a lecturer and principal investigator. She is also a faculty member of the APC Microbiome Institute. The theme of Dervla's research is neuroimmune and neuroendocrine interactions in the enteric nervous system and how communication may be facilitated between luminal microbes and the host nervous system. Dervla has a H-index of 18, having published more than thirty peer-reviewed manuscripts, two book chapters and over sixty conference publications. She is a member of the editorial board for 'World Journal of Gastroenterology' and 'Frontiers in Neuroscience, Physiology & Neurology' and an invited reviewer for over twenty journals in the field of physiology and neuroscience.

Neuro-immune and neuro-endocrine signalling in IBS Pathophysiology.
Irritable bowel syndrome (IBS) is a common disorder characterized by recurrent abdominal pain, bloating and disturbed bowel habit, symptoms which impact on the quality of life of sufferers. The pathophysiological changes underlying this multifactorial condition are complex and include increased sensitivity to luminal and mucosal factors which result in altered colonic transit and visceral pain. Moreover, dysfunctional communication in the bidirectional signaling axis between the brain and the gut, which involves efferent and afferent branches of the peripheral nervous system, circulating endocrine hormones and local paracrine and neurocrine factors, including immune and perhaps even microbial signaling molecules have a role to play in this disorder. Crosstalk between hormones, immune and microbe-derived factors and their neuromodulatory effects on peripheral nerves will be discussed in the context of the functional bowel disorder, IBS.

SESSION 3:

Dr Patrick Harrison
Department of Physiology and BioSciences Institute, University College Cork
"CRISPR Cas9 gene editing – engineering cells to model and treat disease"

The focus of **Dr Patrick Harrison's** lab is the development gene editing for treatment of rare diseases. His early work in this field pioneered the use of ZFNs and CRISPR to successfully repair the most common CF-causing mutation, F508del, in cell culture. The current focus extends the work to correct CF mutations of the deep intron theratype in primary cells, stem cells and animal models. Dr Harrison is a principal investigator in the CF Trust's Gene Editing Strategic Research Centre, and has additional grant funding from the CF Foundation (USA), with collaborations across Europe and the US. He is also using CRISPR editing to model metabolic disorders such as the lysosomal storage disorder Cystinosis, a collaborative project funded by the HRB and Cystinosis Ireland, and is developing editing for skin disorders such as atopic dermatitis and Epidermolysis Bullosa.

CRISPR Cas9 gene editing – engineering cells to model and treat disease
CRISPR Cas9 offers the potential to precisely edit the DNA sequence in the genome of every cell in an organism. Over the last 11 years, the technique has completely changed our ability to manipulate the mammalian genome in experimental animals, and now looks set to radicalise the therapeutic approach for rare diseases – if DNA mutations cause disease, then let gene editing correct them.

But is it really that simple? Our lab has corrected life-threatening Cystic Fibrosis mutations in isolated cells, many other labs have corrected hundreds of other disease-causing mutations in similar model systems, but what about clinical application – surely that's decades into the future? No, gene edited cells have already transformed the lives of at least two patients, eradicating HIV from one, and eradicating lymphoma from another. I will describe the steps our lab is taking to progress gene editing for CF, and highlight other examples from other diseases that are almost ready for clinical trials.

References

- Analysis of gene repair tracts from Cas9/gRNA double-stranded breaks in the human CFTR gene
  Hollywood JA et al. (2016) Scientific Reports **6**: 32230.

- Impact of gene editing on the study of cystic fibrosis.
  Harrison PT et al. (2016) Hum Genet. **135**(9):983-92.

- Genetic medicines for CF: Hype versus reality.
  Alton EW et al. (2016) Pediatr Pulmonol. **51**(S44):S5-S17.

SESSION 3:

Professor Noel Caplice
School of Medicine, University College Cork
"Cardiac repair from mouse to man"

Professor Noel Caplice is a Clinician Scientist with over 25 years' experience having received medical and scientific training in Ireland, Australia and USA. He is clinical/interventional cardiologist and basic and applied researcher in vascular and molecular biology. He trained with some of the world's foremost authorities in vascular biology (Australia – PhD) and interventional cardiology (Mayo Clinic-Fellowship). He has held senior positions Chair and director positions in Ireland (UCC) and USA (Mayo Clinic) over the past 15 years as Associate and Full Professor level. He has published over 160 papers in the scientific literature as manuscripts and conference papers and his work has been cited > 5800 times with an H-index >40. He has won numerous international awards for research in Australia, USA and Ireland, including three Young Investigator awards, the Stokes medal in Cardiology and University Inventor of the year in 2013 and 2015. He is a founding member of the Irish Academy of Medical Sciences. He as mentored several cardiology fellows to national and international Young investigator awards at American Heart (AHA), American College (ACC) and Irish Cardiac Society. He holds 8 US/EU patents and has over 15 invention disclosures. He currently works as an Academic Professor at UCC, a practicing interventional cardiologist at CUH, a cardiovascular educator and directs the centre for research in vascular biology (CRVB) at UCC, which develops basic molecular and cellular concepts from bench to bedside. He has recently completed a first in man trial at CUH on a novel cytoprotective agent (developed at CRVB) for acute myocardial infarction in patients with poor systolic function after heard attack. He serves on the advisory board of a number of the world's leading multinational pharmaceutical and biotechnology companies and as a scientific consultant in the fields of vascular biology, experimental animal models, cardiac cytoprotection post myocardial infarction and vascular stem cell biology.

Oral Presentations: G14 Western Gateway Building UCC

0=Oral Number

O.	Author	Abstract Title
1	CE Aherne et al	Concurrent validity of a Novel touchscreen based assessment tool for measuring cognitive development in toddlers: the Babyscreen app
2	E O Shea et al	Malnutrition in hospitalised older adults: A multicentre observational study of prevalence, associations and outcomes
3	L Helen et al	The 'Smart' Needle – A Needle Integrated with an Impedance Sensor for Objective Nerve Localisation during Ultrasound Guided Peripheral Nerve Block
4	L Daly et al	Malnutrition and body composition predicts quality of life and survival: a cross sectional study of 880 ambulatory oncology patients
5	CM Hueston et al	Lentiviral overexpression of interleukin-1β in the hippocampus induces neurogenesis-associated cognitive deficits in touchscreen learning paradigms
6	D Leahy et al	Profile of Suicides during Economic Recession and Recovery: A Comparison using Coroners' Records in Ireland
7	B Malone et al	Engineering *Lactococcus lactis* as a protein delivery platform for disease treatment
8	AS Naik	E2 glycoprotein epitope mapping in antibody associated hepatitis C virus
9	W Barton et al	The Diet and Exercise-Microbiome Paradigm: Distinct Functional Profiles of the Athlete Microbiome Revealed by Metabonomic and Metagenomic Analysis
10	F Fouhy et al	A longitudinal investigation into the gut microbiota of people with Cystic Fibrosis (CF) and the effects of an altered gut microbiota on functionality and faecal metabolites as determined by the CFMATTERS study
11	K O'Donoghue et al	Towards a translational understanding of colonic bacteria in Crohn's disease pathology
12	S Jahangeer et al	Preclinical validation of Electrochemotherapy in the treatment of lung tumours
13	SM O'Donovan et al	The brain ↔ gut axis in Parkinson's disease (PD): Altered gut pathophysiology and increased gut inflammation in the rAAV-α-synuclein rat model of PD
14	S Whelan et al	Microbiome and morphology: adult germ-free mice exhibit distinct hippocampal dendritic morphological changes

O:1

Concurrent validity of a Novel touchscreen based assessment tool for measuring cognitive development in toddlers: the Babyscreen app

CE Ahearne[1, 2], S Murray[3], C Wrigley[2], E Hennessy[2], R Murphy[4], N Marlow[5], M de Haan[6], DM Murray[1, 2]

[1]Department of Paediatrics and Child Health, UCC, Cork, Ireland
[2]INFANT Centre, UCC, Cork, Ireland
[3]Hello Games, Guildford, U.K.
[4]School of Applied Psychology, UCC, Cork, Ireland
[5]Department of Neonatal Medicine, UCL, London, U.K.
[6]Centre for Developmental Cognitive Neuroscience, UCL, London, U.K.

Background

Assessment of cognitive abilities in toddlers is challenging and limited by a lack of available tools. Deficits in this domain often are often not apparent until later childhood when they have already affected academic progress. Early detection allows opportunities for early intervention. A novel touch-screen cognitive assessment for toddlers, the Babyscreen App, was developed to meet this need. The aim of this study was to examine the concurrent validity of the app against the cognitive subscale of the Bayley Scales of Infant and Toddler Development (Edition 3).

Method

Infants were recruited to the BiHIVE Study, from March 2013 to June 2015. The Babyscreen App was administered alongside the Bayley-3 at age 18 months to 2 years.

Results

The Babyscreen App and Bayley-3 were administered in 110 children (95 healthy control children and 15 high risk children). The item score, speed score and accuracy score of the Babyscreen app for each child correlated significantly with their cognitive composite scores measured by the Bayley-3. Combined measures of overall app performance could predict reduced cognitive scores with an area under the ROC curve of 0.69 (0.55-0.83), p=0.02. In the high risk group reduced app item score predicted cognitive delay with a PPV =86%.

Conclusion

This study has presented the first touch-screen based cognitive assessment for toddlers and has shown good concurrent validity. While further testing is required for assessing construct and predictive validity, the Babyscreen App is a promising tool for cognitive testing in this age group.

O:2

Malnutrition in hospitalised older adults: A multicentre observational study of prevalence, associations and outcomes

E O Shea[1], S Trawley[2], E Manning[1], A Barrett[1], V Browne[1], S Timmons[1]

[1]Centre for Gerontology & Rehabilitation , University College Cork, Cork, Ireland
[2]Centre for Health and Social Research, Australian Catholic University, Melbourne, Australia

Background: Malnutrition is common in older adults and is associated with high costs and adverse outcomes. The prevalence, predictors and outcomes of malnutrition on admission to hospital are not clear for this population.

Design: Prospective Cohort Study.

Setting: Six hospital sites (five public, one private).

Participants: In total, 606 older adults aged 70+ were included. All elective and acute admissions to any speciality were eligible. Day-case admissions and those moribund on admission were excluded.

Measurements: Socio-demographic and clinical data, including nutritional status (Mini-Nutritional Assessment – short form), was collected within 36 hours of admission. Outcome data was collected prospectively on length of stay, in-hospital mortality and new institutionalisation.

Results: The mean age was 79.7; 51% were female; 29% were elective admissions; 67% were admitted to a medical specialty. Nutrition scores were available for 602/606; 37% had a 'normal' status, 45% were 'at-risk', and 18% were 'malnourished'. Malnutrition was more common in females, acute admissions, older patients and those who were widowed/ separated. Dementia, functional dependency, comorbidity and frailty independently predicted a) malnutrition and b) being at-risk of malnutrition, compared to normal status ($p < .001$). Malnutrition was associated with outcomes including an increased length of stay ($p < .001$), new institutionalisation ($p =<0.001$) and in-hospital mortality ($p < .001$).

Conclusions: These findings support the prioritisation of nutritional screening in clinical practice and public health policy, for all patients ≥70 on admission to hospital, and in particular for people with dementia, increased functional dependency and/or multi-morbidity, and those who are frail.

O:3

The 'Smart' Needle – A Needle Integrated with an Impedance Sensor for Objective Nerve Localisation during Ultrasound Guided Peripheral Nerve Block

L Helen[1], B O'Donnell[2], E Moore[1]

[1]Sensing and Separation Group, Chemistry Department & Life Science Interface, Tyndall National Institute, University College Cork, Cork, Ireland
[2]Department of Anaesthesia, Cork University Hospital, Cork, Ireland

As the world of smart technology advances, insensate objects are being transformed to 'smart' devices by the application of sensors. Our research focuses on applying an impedance sensor to a hypodermic needle to create a 'smart' needle. This novel device will use bioimpedance to determine needle-to-nerve proximity for application in ultrasound guided peripheral nerve block (USgPNB) procedures. Bioimpedance data from the needle tip will allow for real-time tissue identification and thus provides the user with the exact needle tip location. For anaesthetists it will provide valuable information indicating needle contact with the nerve covering or dangerous needle position within the nerve. Introduction of this new technology to USgPNB will increase its safety, efficacy and training capacity thus increasing the use of the technique and reducing costs for the healthcare system, as it is a safer quicker alternative to general anaesthesia. The impedance sensor on the 'smart' needle is a miniaturised two electrode set-up. A prototype 'smart' needle, with electrodes directly integrated onto a commercially available needle, has been fabricated and characterisation is underway. Impedance values, using this 2nd generation 'smart' needle prototype, for different substances including saline solutions, phantom gelatine models and different tissue types in meat will be presented. Results have demonstrated that bioimpedance can be used to identify tissue type at the needle tip. The addition of 'smart' needle technology to USgPNB may provide a solution to a currently unmet clinical need.

O:4

Malnutrition and body composition predicts quality of life and survival: a cross sectional study of 880 ambulatory oncology patients

L Daly[1], E Ní Bhuachalla[1], S Cushen[1], DG Power[2], F Dwyer[1], P McEneaney[3], AM Ryan[1]

[1]School of Food and Nutritional Sciences, University College Cork, Cork, Ireland
[2]Department of Medical Oncology, Mercy and Cork University Hospital, Cork, Ireland
[3]Department of Radiology, Mercy University Hospital, Cork, Ireland

Malnutrition is common in the oncology setting and negatively impacts on clinical outcomes. The aim of this study was to assess the impact of malnutrition on quality of life (QOL) and survival.

A cross sectional study of adult cancer patients undergoing chemotherapy between 2012-2016 was conducted. Clinical, nutritional, biochemical and QOL data (EORTC) was recorded. Nutritional status was evaluated using cancer cachexia (CC) diagnostic criteria and CT assessment of body composition. Cox proportional hazards model was used for survival analysis.

880 patients with solid tumours were included (60% male, median age of 64 years). 51% had a BMI>25kg/m^2, while only 5% had visible malnutrition (BMI<18.5kg/m^2). 44% had CC, 41% were sarcopenic, 46% had myosteatosis, 24% had both. Weight loss >5% and CC were significantly associated with a poorer global QOL score, as well as worse physical, role, emotional and social function scores (all p<0.005) and higher symptoms such as fatigue, nausea, pain, appetite and diarrhoea (all p<0.05). Sarcopenia, myosteatosis and CC were all significantly associated with reduced survival, the highest risk of mortality was seen in those with both myosteatosis and sarcopenia. Median survival was 19.3 months (95% CI: 13.7-24.9months) vs. 30.2 months (95% CI: 22.3-38.0months) in those without both conditions (log rank *p*=0.002). On multivariate analysis, controlling for age, sex, performance status, stage, patients with both conditions had increased risk of mortality (HR 1.56, 95% CI: 1.2-2.1, *p*=0.002).

Malnutrition and abnormal body composition are common in Irish cancer patients, but are masked by excessive adiposity. Malnutrition can adversely impact on patients QOL and survival.

O:5

Lentiviral overexpression of interleukin-1β in the hippocampus induces neurogenesis-associated cognitive deficits in touchscreen learning paradigms

CM Hueston[1], JF Cryan[1, 2], YM Nolan[1]

[1]Department of Anatomy & Neuroscience, University College Cork, Cork, Ireland
[2]APC Microbiome Institute, University College Cork, Cork, Ireland

Adult neurogenesis within the dentate gyrus of the hippocampus is integral for normal cognitive function, especially for spatial memory tasks and pattern separation tasks. Previous studies have demonstrated that acutely elevated levels of the pro-inflammatory cytokine interleukin-1β (IL-1β) in the hippocampus has detrimental effects on some aspects of memory and cognitive function, and a negative impact on the proliferation and survival of newly born neurons. Touchscreen-based platforms for testing cognitive function have been developed that allow several different types of memory and learning to be assessed, including pattern separation which can be tested using the location discrimination paradigm. The current study aimed to assess whether long-term increased expression of IL-1β would alter performance in pattern separation using the touchscreen location discrimination test. To accomplish this, adult male Sprague-Dawley rats were first trained to use the touchscreen testing apparatus, and to perform intermediate-separation location discrimination. Once all animals had passed criteria, a lentivirus overexpressing IL-1β/mCherry or a control virus expressing only mCherry was bilaterally injected into the dorsal dentate gyri of rats. Two weeks after injection, rats were re-tested on the intermediate location discrimination task to check post-surgical performance. Rats were then introduced to the large and small separation aspects of the pattern separation task. IL-1β overexpression in the dorsal hippocampus resulted in impaired performance in the large, but not the small location discrimination task. The results from the current experiment suggest that chronic overexpression of IL-1β in the hippocampus induces a deficit in pattern separation, a hippocampal neurogenesis-dependent cognitive behaviour.

O:6

Profile of Suicides during Economic Recession and Recovery: A Comparison using Coroners' Records in Ireland

D Leahy[1, 2], C Larkin[1], J McCarthy[1], S Leitao[1, 2], E Williamson[1], B Greiner[2]

[1]National Suicide Research Foundation, University College Cork, Cork, Ireland
[2]Department of Epidemiology and Public Health, University College Cork, Cork, Ireland

Introduction: The economic recession has been associated with increased suicide rates in a number of countries, unemployment levels in Ireland grew from 4% in 2007 to 15% in 2012. However, less is known about the characteristics of suicides during the recession compared with the characteristics of those that occurred during the subsequent economic recovery. Changes to the risk profile of suicide between recession and recovery would have implications for suicide prevention policy. This paper compares characteristics of recession-era suicides (n=307) to post-recession suicides (n=121) in Cork.

Methods: As part of the Suicide Support and Information System, consecutive coroners' records of suicides and probable suicides were reviewed for demographic, psychosocial, and psychiatric characteristics. Coroners' records include family and witness statements, medical records, police summaries, post-mortem reports, and toxicology analysis results. Included cases went to inquest from 2008-2012 ("recession-era") and 2014-2016 ("post-recession") in Cork (population 119,230). Proportions with 95% confidence intervals were compared between the two groups of cases.

Results: Based on preliminary analysis, post-recession suicides were more likely to be male, older, single, and to have left a suicide note, but less likely to be in paid employment or to have alcohol in their toxicology, however, none of these differences reached statistical significance.

Conclusions: Although rates of suicide increased during the recession, the characteristics of suicides in Cork do not appear to have changed significantly between recession and recovery. Our findings suggest that middle-aged males continue to be a group at risk of suicide, even at a time of economic recovery.

O:7

Engineering *Lactococcus lactis* as a protein delivery platform for disease treatment

B Malone[1], K Ryan[1], D Fitzgerald[1], R Walsh[1], S Suebdi[1], J Meeke[1], A Bergin[1], A O'Brian[1], M Tangney[2,5], C Gahan[3,4,5]

[1]School of Biochemistry and cell biology, UCC, Cork, Ireland
[2]Cork Cancer Research Centre, UCC, Cork, Ireland
[3]School of Microbiology, UCC, Cork, Ireland
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Lactococcus lactis, a generally recognised as safe (GRAS) bacterium commonly used in food production, is highly amenable to genetic manipulation. We aim to develop a synthetic L. lactis-based platform that can deliver proteins to immune cells to precisely influence the host immune response for use in the treatment of various diseases. Potential applications which we have investigated include vaccination strategies and macrophage modification. We have developed the platform as a vaccine against leishmaniasis, a neglected tropical disease increasing in geographical distribution. LJM11 is an immunogenic salivary protein of the sandfly vector, Lutzomyia longipalpis. Our inexpensive platform, through simple oral administration, has the capacity to deliver this protein to antigen-presenting cells, and potentially immunise against the life cycle of leishmaniasis. Besides vaccination strategies, this platform may be employed to modify the phenotype of other phagocytic cells associated with diseases such as cancer.

O:8

E2 glycoprotein epitope mapping in antibody associated hepatitis C virus

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Background & Aim: Humoral immune system responds to the chronic hepatitis C virus (HCV) infection by producing neutralising antibodies (nAb). In this study, we identified E1E2 glycoprotein sequence which was targeted by host humoral immune system. Uniquely our study focused on characterizing epitopes targeted by patient derived virus free Fab (VF-Fab) using chemically linked peptides on scaffolds (CLIPS) technology.

Methods: HCV infectious sera from genotype 1b was segregated into antibody (Ab) free and antibody associated virus (AAV) population. Based on the available anti-HCV monoclonal nAb mapping information we selected amino acid region from 384-620 for conformational epitope mapping. A library of peptides (Linear peptides, loop mimics and helical structure) was synthesized using CLIPS technology (Pepscan Presto; Lelystad). VF-Fab fragments were obtained from HCV genotype 1a (n=1), genotype 1b(n=2) and genotype 3a(n=1) by treating the source sera with proteinase K. The binding of each of the VF-Fab to the synthesized peptides was tested in a PEPSCAN-based ELISA.

Results: Five binding motifs were identified by four VF-Fab in the AAV sequence upon peptide mapping. Two ($AN2_{433-445}$, $AN3_{428-447}$) out of five motifs share amino acid resides with HuMAb AR3C and CBH-2 and lie on the neutralisation face of the E2. Epitopes $AN1_{393-405}$ which lies in the HVR1. $AN4_{539-550}$ and $AN5_{599-608}$ have not been reported previously.
In summary, we identified epitopes in the AAV sequence which were targeted naturally by host immune system.

O:9

The Diet and Exercise-Microbiome Paradigm: Distinct Functional Profiles of the Athlete Microbiome Revealed by Metabonomic and Metagenomic Analysis

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The contribution of the human intestinal microbiome to host health has become increasingly apparent over the past decade. It is evident that the gut microbiota and factors that influence its composition and activity influence human metabolic, immunological, and developmental processes. Most and perhaps all elements of modern lifestyle influence the intestinal microbiota, including habitual diet and even sedentary occupation and physical conditioning. Extreme physical activity such as that pursued by elite or professional athletes and associated dietary adaptations have been correlated with changes in faecal microbial diversity and composition relative to that of controls with a sedentary lifestyle. However, it has not been established if these compositional differences are linked with variation in microbial functionality. Here, we show by metabolic phenotyping and functional metagenomic analysis, that extreme physical activity and associated dietary adaptations of professional international rugby union players is associated with functional differences in the gut microbiome. Athletes had relative increases in pathways (e.g. amino acid and antibiotic biosynthesis and carbohydrate metabolism) and metabolites (e.g. short chain fatty acids [SCFAs] acetate, propionate, and butyrate) associated with enhanced muscle turnover (fitness) and overall health when compared to control groups. Thus, the state of physical fitness is not limited to the host alone and appears to include conditioning of the microbiota.

O:10

A longitudinal investigation into the gut microbiota of people with Cystic Fibrosis (CF) and the effects of an altered gut microbiota on functionality and faecal metabolites as determined by the CFMATTERS study

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Cystic Fibrosis (CF) causes alterations to the gut microbiota. Limited longitudinal data exist on the gut microbiota of CF adults. CFMATTERS is examining the gut microbiota in CF (during stability, exacerbation and post-exacerbation) and interrogating the effects of gut microbiota alterations on functionality, using whole genome sequencing and metabolomics.

To address temporal changes to the gut microbiota, faecal samples were collected from people with CF at stability, during pulmonary exacerbation and post-exacerbation. DNA was extracted and the 16S rRNA gene was sequenced on the Illumina MiSeq platform. To investigate the functionality of the gut microbiota, faecal samples from 6 people with CF and 6 controls were collected, DNA extracted and sequenced using whole genome sequencing (MiSeq platform). Metabolomic analysis was conducted on faecal water.

Pulmonary exacerbation resulted in an altered gut microbiota. Decreased levels or absence of *Bifidobacterium* occurred during exacerbation, and often recovery was incomplete even 3 months' post-exacerbation. Several individuals had a dominance of *Enterococcus* during exacerbation (up to 90% of genus reads in some patients). Functionality was also altered between stable CF patients and controls. Pathways involved in lipid metabolism (e.g. unsaturated fatty acid biosynthesis (PWY 6284) ($p=0.016$) and fatty acid biosynthesis (PWY 6285) ($p=0.025$)) and xenobiotic degradation were higher in the CF group compared to controls. Metabolites were also altered, with 57% being significantly increased in the CF group compared to the controls.

This study presents novel longitudinal data on the CF gut microbiota and highlights the impact of such alterations on metabolites and microbiota functionality.

O:11

Towards a translational understanding of colonic bacteria in Crohn's disease pathology

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Crohn's disease (CD) is a chronic inflammatory condition of the gastro-intestinal tract with unidentified pathogenesis, although it is recognised to be initiated by a complex interplay of factors including, genetic susceptibility, microbiota composition, immune responses and environmental triggers. The primary goal of this project is to reveal the mechanisms of bacteria-host interactions provoked by bacteria identified from inflamed and un-inflamed colon biopsies of CD patients. This is to be accomplished using both in vitro and in vivo models. A small intestinal organoid system has been established and validated by immunohistochemistry and RT-qPCR showing that enterocytes and goblet, enteroendocrine and Paneth cells are present and that barrier function is maintained in organoids cultured for 8 days. An IL10-/- mice colony has also been established and RT-qPCR and ELISA analysis for inflammatory markers on colon tissue and fecal samples from mice aged between 6 and 21 weeks old revealed an increase in inflammatory markers in mice older than 13 weeks. However, the analysis also revealed that there is a subpopulation of mice that don't develop colitis. Future work will include organoid culture and IL10-/- mouse colonisation with selected bacterial strains and assaying for inflammatory cytokines, barrier function, epithelial cell proliferation and differentiation.

O:12

Preclinical validation of Electrochemotherapy in the treatment of lung tumours

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Background
Lung cancer has one of the lowest survival rates. Electrochemotherapy (ECT) has emerged as a novel treatment modality, but has yet to be validated in treating lung lesions.

Objectives
Validation of ECT requires the efficacy and safety of this therapy to be established. A novel electrode array system was used to deliver the intended electric pulses. The efficacy was assessed using two murine lung cancer cell lines. ECT was compared to already established treatments in the pig experiment.

Methods
Two murine cell lines, C57 Mouse Tumour 64 (CMT-64) and Lewis Lung Carcinoma (LLC) were used. For each experiment., the animals were divided into 4 groups of 10 mice each: Untreated, Cisplatin only, Electroporation and Electrochemotherapy.
The pigs were divided into 5 groups of 6 pigs each (Sham, Electroporation, Electrochemotherapy, Irreversible Electroporation and Radiofrequency Ablation). 3 pigs from each group were sampled for Histological analysis at specific time points. Outcomes measured for the murine experiment was survival up to 90 days. Air leaks, drainage, areas of opacification on Computerized Axial Tomography scan and histological changes were assessed in the pig experiment.

Results
A 90% survival rate in the CMT-64 group and a 60% survival rate in the LLC group was achivied with ECT. In the pig experiment, minimal air leak and drainage volume were recorded in ECT groups. CT scanning demonstrated the areas treated with ECT was preserved. Histological analysis showed no permanent destruction of the lung parenchyma in the ECT.

Conclusions
Electrochemotherapy, delivered via a novel electrode array was both effective and safe in targeting Lung lesions.

O:13

The brain ↔ gut axis in Parkinson's disease (PD): Altered gut pathophysiology and increased gut inflammation in the rAAV-α-synuclein rat model of PD

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Parkinson's disease (PD) is a neurodegenerative disorder, characterized by the progressive loss of dopaminergic neurons in the substantia nigra and the toxic build-up of α-synuclein. Early involvement of gastrointestinal pathophysiology in PD has been recognized with many non-motor dysfunctions, including constipation, gastroparesis, dysphagia, preceding motor symptoms, and recent studies showing gut microbiome alterations in PD. Research has focused on how PD α-synuclein pathology may originate in the gut enteric nervous system (ENS) and spread via vagal ganglionic nerves to brain. However, limited information is available on whether CNS accumulation of α-synuclein impacts gut pathophysiology. Implementing adeno-associated-vector (AAV) over-expression of human α-synuclein (rAAV-α-syn) in the rat brain, we aimed to determine whether this CNS initiated preclinical model of PD displayed altered gut pathophysiology. The model induced significant changes in faecal bile acid composition, thus current studies are investigating whether these changes correlate with microbiota alterations. Examination of colonic wholemount samples demonstrated that the ENS submucosal plexus of rAAV-α-syn rats had significantly increased levels of the glial markers S100β and GFAP compared to controls, suggesting that overexpression of α-synuclein in the brain increases inflammation in the gut. Interestingly, no human α-synuclein was detected in these colonic enteric wholemounts. However, increased numbers of myenteric neurons positive for endogenous rat α-synuclein were observed in rAAV-α-syn injected rats compared to controls. Together, these findings suggest that accumulation of α-synuclein in the CNS causes a number of changes to gut pathophysiology including an inflammatory phenotype, indicating a bidirectional relationship between the gut and brain in PD.

O:14

Microbiome & morphology: adult germ-free mice exhibit distinct hippocampal dendritic morphological changes

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Introduction: Germ-free (GF) mice, born and reared in an aseptic isolator, are an important model used to elucidate the influence of the microbiota-gut-brain axis in health and disease. These mice have been wide-ranging alterations in their physiological and behavioural profiles, including impairments in neurogenesis, cognition and anxiety-like behaviours. It is possible that changes in hippocampal structure could underlie the altered behavioural and physiological features of GF mice.

Materials and Methods: Using design-based stereology we compared the volumes of the total, dorsal and ventral hippocampus, and that of the granular layer of the dentate gyrus (DG), between GF mice and conventionally-colonised controls (CC). We also compared the dendritic arborisation (using Sholl analysis) and dendritic spine densities of dorsal hippocampal DG granule cells between these groups.

Results: A reduction in dendritic branching was observed in the GF mice compared to the CC. This finding was localised to the infralimbic blade of the DG and accompanied by a reduction in dendritic complexity on Sholl analysis but not by a reduction in dendritic length. No significant differences were seen in hippocampal volumes between GF mice and controls, nor in the volume of the granular layer of the DG. Spine densities did not vary between groups.

Conclusion: These results are the first to investigate the association between microbiome and hippocampal morphology, and suggest that the microbiota is a key mediator of the structural integrity of the dorsal hippocampus. This has implications for dorsal hippocampus-dependent behaviours, such as spatial memory and pattern separation, in GF mice.

Notes:

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P:1

Impact of Dementia Caregiving on Cognition Attenuated by Stress Reduction Techniques

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Background: Caring for a relative with dementia is associated with heightened stress, anxiety and depression, and may impact upon central nervous system activity. The current study aimed to examine the cognitive neurobiology and mental well-being of dementia caregivers.

Methods: We examined mental well-being and cognitive performance in dementia caregivers and non-caregiving controls. Participants completed validated tests of stress, anxiety, and depression, and cognitive tasks from the CANTAB battery. A sub-set of caregivers completed both a carer training program and mindfulness-based stress reduction (MBSR) group program. Each program was delivered by an experienced instructor and lasted 6-8 weeks.

Results: Our preliminary study results suggest the presence of higher levels of stress and depressive symptoms in caregivers compared to controls. Caregivers also made a higher number of errors on the paired associates learning task (PAL), which engages the hippocampus, suggesting poorer visuospatial memory, as well as impaired performance on rapid visual information processing, suggesting poorer sustained attention. However, following both carer training and MBSR, caregivers' performance improved on both tests.

Conclusions: Dementia caregiving is associated with heightened biomarkers of stress, high self-reported levels of stress and depression as well as impaired cognition. Carer training and MBSR may be beneficial in improving cognitive performance. A comprehensive physiological phenotyping of dementia caregivers is required to better understand the mechanisms of these effects.

P:2

Medical Records: Is record keeping in primary care related to clinical outcome for patients with diabetes?

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Introduction: Patients with diabetes achieve better clinical outcomes when they receive high quality, structured care. Thorough recording of clinical data is considered an important structure in patient care. Despite this, there has been little research into the relationship between the quality of medical records and clinical outcome for patients with diabetes.

Aim: To compare the quality of the medical records kept by general practitioners, in terms of completeness of recordings to patient outcome.

Methods: A retrospective review of the medical records of patients with diabetes from the DiGP database was conducted on a sample of general practices in Cork. Collected data included recordings of indicators of renal and cardiovascular risk. The quality of medical records were determined by the presence or absence of these recordings. Patient outcome was assessed within parameters commonly used to evaluate diabetes control.

Results: Twenty seven general practices with 2,517 patients with diabetes were studied. Percentage completeness of recordings ranged from 5 to 64%. The ability of patients to meet targets in glucose control, blood pressure, lipid management and body mass index was superior in patients whose records achieved higher percentages of completeness of recordings.

Conclusion: There is marked variability in the completeness of medical records of patients with diabetes. Overall, there is a disappointing level of data recording. Despite this, targets in diabetes control tend to be met to a greater degree in patients whose medical records are of a higher quality. Medical record keeping in primary care is related to clinical outcome in patients with diabetes.

P:3

The Psychological Effects of Bariatric Surgery

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Introduction:

Bariatric surgery has been shown to improve quality of life and cause major reduction in psychological symptoms such as anxiety and depression in morbidly obese patients. This study aimed to identify psychological functioning in morbidly obese patients and also to evaluate the differences in quality of life, and levels of anxiety and depression, pre- and post- bariatric surgery.

Methods:

All patients who underwent bariatric surgery at Bon Secours Hospital, Cork between November 2011 and May 2014 were evaluated preoperatively and at 6-month and 12-month postoperatively. The Quality of Life (QOL) Index Scoring Form, Beck Inventory II (BDI-II), and Hospital Anxiety and Depression Scale (HADS) were the questionnaires examined in the study.

Results:

52 patients (15 males, 37 females; preoperative mean age 49.3±12.2 years; mean body weight 136.7±25.3 kg; mean BMI 49.9±7.2 kg/m^2) were evaluated in this study. Significant improvement were seen in all psychological measures. Mean QOL scores were improved from 8.08±1.41 preoperative to 9.40±1.21 and 9.56±0.89 at 6-month and 12-month postoperative, respectively. Depression symptoms were reduced from 13.1±7.42 preoperative to 6.08±5.51 at 6-month and 5.56±10.6 at 12-month postoperative based on BDI-II scores. Mean HADS scores were also decreased from 6.46±3.92 preoperative to 2.02±2.82 at 6-month and 1.60±3.41 at 12-month postoperative. These improvements were statistically and clinically maintained 12 months after surgery.

Conclusions:

Morbidly obese patients who undergo weight loss surgery have high incidence of anxiety and depression, as well as impaired quality of life, preoperatively. Significant clinical improvements in psychological functioning were observed following bariatric surgery.

P:4

The gut microbiota in Schizophrenia

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Schizophrenia is a chronic enduring, relapsing, remitting illness resulting in significant social drift and associated cognitive decline.

Despite the suspicion of a genetic component to schizophrenia, given the high heritability observed and particularly the concordance amongst twins, no genetic profile has been identified as a causative agent for schizophrenia.Given the absence of clear identification of causative agents in the genetics of schizophrenia, it is reasonable to consider other factors may play a role in schizophrenia. Research is being carried out on the brain-gut-axis and the role of microbiota and Short-Chain-Fatty-Acids. The gut microbiome has been shown to have an influential role in depression, diabetes, gastric ulcers, amoung others.

It is our intention to investigate the role the gut-brain-axis plays in schizophrenia and whether the gut microbiome has any effect on schizophrenia.

This will involve profiling the gut microbiota present in a schizophrenic population. We will also investigate the Small Chain Fatty Acids, metabolomics and effects of faecal transplantation into rat models of the gut microbiota.

50 subject will be recruited from the greater Cork area, across multiple clinics and sectors, and from the inpatient unit. Approval of the study protocol was sought and granted by the Clinical Research Ethics Committee of the Cork Teaching hospitals. Faecal and blood samples will be collected. 50 Controls will be matched for ethnicity, gender and age.

Microbiota and SCFA will be examined from DNA extracted from faecal samples.

Data will be analysed for significant alterations in the microbiota in schizophrenic population vrs controls.

P:5

The bacterial metabolite indole signals to the CNS using L-cells to activate vagal neve activity.

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INTRODUCTION:Dysbiosis of the microbiome is associated with functional bowel disorders and CNS diseases but how the microbiota in the external environment of the gut signal to the brain is unclear. In this study, we have investigated one bacterial product, indole,which interacts with L-cells to stimulate the secretion of GLP-1, transmitting microbial signals to the internal milieu and the CNS.

METHODS: A novel dissection technique facilitated the recording of extracellular nerve activity in the vagus nerve following mucosal stimulation of the distal colon of male Sprague Dawley rats.Nerve activity was recorded using a bipolar electrode and the signal amplified, recorded and analysed using Chart7. Calcium imaging recordings were carried out in colonic submucosal plexus preparations loaded with the ratiometric calcium indicator, Fura 2-AM. Immunofluorescence images of GLP-1 receptor expression in colonic submucosal neurons were recorded using a confocal microscope.

RESULTS: When the mucosa was exposed to indole, increased GLP-1R immunostaining was evident in the submucosal ganglia. Although direct application of indole had no effect on intracellular calcium in submucosal neuronal, mucosal application of indole potentiated GLP-1-evoked calcium responses ($P<0.05$, $n=3$). Excitingly, exposure of the distal colonic mucosa to indole stimulated vagal nerve activity ($n=3$, $P<0.05$), a response that was attenuated by a GLP-1 receptor antagonist.

CONCLUSION: Our findings provide the first tangible evidence of a signalling mechanism from the luminal bacteria in the external environment of the distal colon to the CNS. L-cells appear to be key in transmitting the microbial signal across the gut barrier to the intrinsic and extrinsic nerves including the vagus nerve

P:6

Restoration of pharyngeal dilator muscle force in dystrophin deficient (*mdx*) mice following co-treatment with neutralising IL-6 antibodies and Urocortin-2

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Duchenne muscular dystrophy (DMD) is an x-linked genetic disease resulting in the absence of the structural protein - dystrophin. Patients mainly die prematurely due to respiratory and cardiac failure. The mdx mouse (DMD model) shows evidence of reduced normoxic ventilation and impaired respiratory muscle function.

Six week old mdx (C57BL/10ScSn-Dmdmdx/J; n=24) and wild-type (WT; C57BL/10ScSn; n=23) mice received saline (0.9% w/v) or co-treatment of neutralizing IL-6 receptor antibodies and corticotrophin releasing factor receptor 2 agonist. Sternohyoid muscle contractile function was examined ex vivo. Muscle fibre nucleation and inflammatory cell infiltration were examined by haematoxylin and eosin staining. Fibre type analysis of cross-sectional area and areal density was determined by myosin heavy chain (MHC) immunofluorescence. Values are reported as mean±SEM and data were compared by two-way ANOVA with Bonferroni post-hoc test.

Peak specific force (Fmax) was significantly reduced in mdx (4.3±0.5 N/cm2) compared with WT (7.7±0.6). Co-treatment significantly increased Fmax (8.0±0.9) and mechanical power production in mdx. The percentage of centrally-nucleated muscle fibres (25±1% vs. 0.5±0.1%) and areal density of inflammatory cell infiltrates (5±1% vs. 0.9±0.1%) was significantly increased compared with WT. The areal density of MHCIIx fibres was significantly increased (31±2% vs. 20±2%), whereas MHCIIb fibres was significantly decreased compared with WT (52±2 vs. 62±2%).

Co-treatment restored mechanical force and power in dystrophic sternohyoid muscle. Co-treatment reversed fibre transitions in mdx. Preservation of MHCIIb fibres may underpin the recovery of force production in the mdx co-treated mice. These data may have implications for the development of pharmacotherapies for DMD.

P:7

GUIDELINES COMBINED WITH EDUCATIONAL MESSAGES TO IMPROVE THE USE OF IMMUNOGLOBULIN TESTS IN PRIMARY CARE: AN INTERRUPTED TIME SERIES WITH SEGMENTED REGRESSION ANALYSIS

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Background Implementation science experts recommend that theory-based strategies, developed in collaboration with healthcare professionals, have a greater chance of success. In this study, the impact of a theory-based strategy for optimising the use of serum immunoglobulin testing in primary care is evaluated.

Methods We devised an intervention comprising of a combined guideline and educational messages based strategy, targeting previously identified general practitioner issues relevant to testing for serum immunoglobulins in the South of Ireland. The intervention was evaluated using an interrupted time series with segmented Poisson regression models using routine laboratory data from January 2012- July 2016. The data was organised into fortnightly segments (96-time points pre- and 20 post-intervention) and analysed using incidence rate ratios with their corresponding 95% confidence intervals along with parameter coefficients and standard errors.

Results In the most parsimonious regression model (change in trend pre- and post-intervention), the change in trend before and after the introduction of the intervention was statistically significant. The intervention was associated with a 1.5% percent reduction in the slope per fortnight (-1.51; 95% CI: -1.16, -1.86, $p<0.001$).

Conclusion Our tailored guideline combined with educational messages reduced serum immunoglobulin test ordering in primary care. Given the rarity of the conditions for which the test is utilised and the fact that we only have population (and not individual patient level) data, further investigation is required to examine the clinical effects of this change in test ordering patterns.

P:8

Can Resource Consciousness Be Taught – The Role of Education

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Introduction: There has been a continual movement to encourage clinicians to become more involved in the management of hospital resources. Previous research has shown clinicians to be the main consumers of organisational resources, with their decision making accounting for up to 70 per cent of expenditure. However, the medical education of clinicians concentrates on meeting the clinical needs of individual patients. As a result, clinicians are ill-prepared for taking a meaning role within the hospital community in promoting resource efficiency and in containing health care costs.

Aim: To assess attitudes amongst non-consultant hospital doctors (NCHDs) towards resource-conscious clinical practice and to evaluate a clinician-led, accountancy partnered educational intervention delivered to NCHDs with specific focus on resource-conscious decision-making.

Methods: An electronic survey was devised and sent to 260 NCHDs in a large, acute, public hospital in Ireland. Participants were asked to rate their agreement with statements related to resource conscious decision-making. A random sample of respondents attended an educational intervention and completed a post-intervention survey.

Results: Respondents identified resource consciousness as part of their role but few considered the resource implications of their decisions in their daily practice. The educational intervention was found to be beneficial, informative and relevant to clinical practice.

Conclusion: NCHDs recognise the need to be resource-efficient and would broadly welcome interventions aimed at improving and promoting resource efficiency.

P:9

EU burden of Non-Communicable Diseases (NCDs):1990-2013

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Introduction:NCDs are major causes of disability and deaths in the European Union(EU).In 2015, World Health Organisation(WHO)reported that approximately 38million lives were lost to NCDs worldwide.NCDs impact both healthcare system and society.Thus,it is important to inform policymakers and public about NCD burden towards shaping health and well-being of population.Such comprehensive estimates are lacking in EU.

Objectives:To estimate NCD deaths and burden alongwith NCD-attributable risk factors between 1990 and 2013 across 28-nations of the EU(including UK).

Methods:Publicly available data from US Institute of Health Metrics and Evaluation was abstracted to estimate deaths,Disability-Adjusted-Life-Years(DALYs) and Years-lost-to-premature mortality(YLLs) from NCDs and NCD-attributable risk factors employing the comparative risk assessment(CRA) framework of the Global Burden of Disease methodology.

Results:NCDs accounted for approximately 4.4million(88.8%) and 4.7million(90.4%)deaths in 1990 and 2013.126.34(95%Uncertainty Interval=113million-141million)and 126.86million(95%UI=111million-144million)DALYs were lost from NCDs in 1990 and 2013, respectively.YLLs from NCDs increased between 1990(81%)and 2013(86%).Dietary risks contributed to approximately 31% and 24% of NCD deaths,followed by high systolic blood-pressure(31%and 24%).Contribution of tobacco-use,alcohol consumption,high-BMI and low physical activity to NCD deaths,DALYs and YLLs declined from 1990 to 2013.Of the NCDs,CVD contributed to the largest overall health metrics followed by cancers(1990 and 2013).Females had higher deaths(1990 and 2013),males had higher DALYs and YLLs(1990 and 2013).

Conclusion:NCD burden in EU is huge(~4.7 million deaths and ~126 million DALYs).To achieve WHO target of 25% reduction in NCDs by 2025,more aggressive but cost-effective population-based tobacco control and food policies targeting health and gender inequalities,are crucially needed.Our findings indicate that some observed patterns are due to population-ageing and population-growth but further sub-regional analyses are important.

P:10

Selected Non-Communicable Disease (NCD) burden attributable to dietary risks and low physical activity levels for the Republic of Ireland in 1990 and 2013

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Background:Lower physical activity levels and dietary risks are associated with increased risk of several NCDs.Changes in dietary and lifestyle patterns are becoming increasingly significant causes of disability and premature death.

Methods:Openly accessible data for NCDs(IHD,stroke,COPD,diabetes and cancer) and risk factors(low physical activity,dietary risks-diet high in processed meat, sodium,trans-fatty acids,diet low in fruits and vegetables) was abstracted from the Institute of Health metrics and Evaluation(United States)website for Ireland.Burden metrics computed were-YLDs:product of disability weight and prevalence;Years of Life Lost to premature mortality(YLLs):product of total deaths at each age and the reference life expectancy at that age;and DALYs=YLDs+YLLs.The estimates are based on total disease conditions and risk factors and are analysed on the GBD study.Absolute number of deaths,DALYs(per 100,000) and YLDs(per 100,000) from the NCDs attributable to the risk factors for 1990 and 2013 are calculated.

Results:Low physical activity levels contributed to the largest number of deaths,DALYS and YLDs from selected NCDs for 1990 and 2013.Deaths from the NCDs attributable to selected risk factors declined from 1990 to 2013 for all risk factors except for diet high in processed meat(increased from 1138(1990)to 1238(2013)).Total DALYS(per 100,000) from the NCDs attributable to all risk factors almost halved from 4722 in 1990 to 2219 in 2013.YLDs(per 100,000) from the NCDs attributable to low physical-activity and diet high in processed meat showed increase over the years.

Conclusion:NCD deaths and burden related metrics attributable to the risk factors have improved considerably in Ireland between 1990 and 2013 except for diet high in processed meat which requires effective intervention and stricter policies.

P:11

Ivacaftor does not produce a significant change in anti-Pseudomonas aeruginosa antibodies

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Background: Ivacaftor is the first CFTR potentiator to become available for treating patients with CF with gating mutations. Emerging work has suggested a reduction in Pseudomonas aeruginosa (Pa) in sputum culture after treatment with ivacaftor. Recently blood anti-Pseudomonas aeruginosa antibodies have been suggested to be more sensitive and specific than respiratory culture for evaluating Pa status.

Methods: Anti-*Pa* Abs titers were measured by ELISA (Mediagnost) in blood from 21 patients with CF with the G551D mutation before commencing ivacaftor and after 1 year of treatment. Clinical data for the cohort was obtained and Pa status as defined by Leeds Criteria based on standard hospital culture data was also compared to antibody status.

Results: Significant improvements in lung function and pulmonary exacerbation frequency were observed post-ivacaftor. There was no significant change in Pa status based on anti-Pa ab (*p = 0.105)* or in antibody titres (protease (*p = 0.79)*, exotoxin-A (*p = 0.87),* elastase (*p = 0.59))* post-ivacaftor.

Conclusion: We report no significant change in anti-Pa antibody titres or category after ivacaftor in a clinically responsive cohort. Further work is required to fully evaluate the impact of ivacaftor on Pseudomonas aeruginosa in patients with CF.

P:12

The Epidemiological Features of Herpes Simplex Virus Cases in a Cork Sexually Transmitted Infection Clinic

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Background: The transmission of sexually transmitted infections (STI) and human behaviour are intrinsically linked. A clear understanding of the behavioural and demographic characteristics that increase the risk of acquisition of these infections is vital for effective STI control.

Objective: To establish risk factors for the presence of genital herpes simplex virus (HSV) infection.

Methods: A retrospective study, examining demographic, behavioural and diagnostic data of patients who attended a Cork STI clinic from 2011 to 2015 inclusive. Multivariate logistic regression models were used to study the epidemiological features of patients with a genital HSV infection (N=296) in comparison to a control population of patients with negative screen (N=307).

Results: Female gender (P<0.001), age (P<0,001), ethnicity (P<0.03) and reason for clinic visit (P<0.001) were significant predictors of genital HSV in both sexes. Males and Females aged between 25 to 30 years had the highest odds of acquiring genital HSV (P<0.001). Patients who were of Irish ethnicity were 51% less likely to have a genital herpes infection than their non-Irish counterparts. Females who first engaged in sexual intercourse under the age of 17 years were more likely to present with the infection than those who abstained until age 22 or older (OR: 7.427, P<0.01). High number of sexual partners was inversely proportional to risk of presenting with HSV infection for both males and females.

Conclusion: The presence of a genital HSV infection was associated with multiple sexual and demographic risk factors. Risk factors for acquiring a genital HSV infection were different for males and females and this is important to recognise when tailoring educational campaigns for target groups.

P:13

Ethanolamine degradation in Urinary Tract infections, a selective advantage for E. coli ?

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Urinary Tract infections (UTIs) are common, usually resulting from ascent of enteric microbes via the urethra. Uropathogenic E. coli (UPEC) behaving as commensals in the gut cause most UTIs. Both central metabolism and catabolic pathways are essential for persistent colonisation of the intestine by E. coli. Microcompartment-mediated metabolism of small carbon compounds allows overgrowth of Enterobacterial pathogens during acute enteric infection. Less is known about E. coli metabolism in the urinary tract. We sought to determine if E. coli employs microcompartment-mediated metabolism of ethanolamine, a cell breakdown product, during UTI. We analysed 70 clinical urinary tract infection (UTI) samples by conventional culture, genomic sequencing and qRT-PCR. We found evidence of E. coli Eut operon mRNA transcription by RT-PCR in approximately 13% of unselected (i.e. not prescreened as E. coli) urine samples. MALDI typing of the isolates confirmed that E. coli was the most prevalent infectious agent in the sample group. Sequencing of 38 E. coli isolates assigned over 50% to Phylogroups B2 and D. ST69 (8 strains) was commonest. Ten strains contained the intestinal pathogenic E. coli (IPEC) marker astA gene encoding the EAEC heat stable toxin EAST1, atypical for UPEC. In vitro growth experiments confirmed clinical isolates utilized ethanolamine. We plan to investigate ethanolamine utilisation by examining both microbial and host signalling to elucidate the dialogue during UTI. Our findings could result in the identification of areas for rapid diagnostics of infection facilitating targeted therapeutics, and show metabolic vulnerabilities of infecting E. coli which could be exploited in therapy.

P:14

Frequently used drug types, multiple drugs and alcohol involvement in intentional drug overdose in Ireland: a national registry study

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Intentional Drug Overdose (IDO) is the most common form of hospital treated self-harm. This research examines the profile of persons who present with IDO and describes the drugs used with respect to gender and age profile, multiple drug use and alcohol involvement.

Using the National Self-Harm Registry we examined self-harm presentations between 1/01/2012 and 31/12/2014. Drugs were categorised according to the Anatomical Therapeutic Chemical (ATC) classification system.

18,329 IDO presentations were recorded, 59% were female and 52% were aged 15-34 years. Alcohol was present in 41% of acts. Multiple drug types were used in 47% of presentations with 12% of IDOs involving four or more drug types. The average number of tablets taken in IDO was 20.

Psycholeptics were used in 43% of IDOs, most commonly in males. Analgesics were taken in 32% of acts and their use peaked in those under 25 years (40%). Antidepressants were taken in 22% of IDOs with alcohol involved in 24% of such acts. Musculoskeletal system and antiepileptic drugs were used in 12% and 9% of IDOs. Illegal drug use was three times more common in male presentations (10% vs 3%).

Paracetamol was the most frequently used drug in IDO (32% females; 21% males). Other frequently used drugs included diazepam, ibuprofen, zopiclone, zolpidem, pregabalin, escitalopram and venlafaxine. Alcohol involvement was highest for IDOs involving benzodiazepines and lowest for paracetamol and ibuprofen.

These findings highlight the need to review prescribing practices, adherence to prescription medications and restrictions to accessing drugs commonly used in IDO.

P:15

Associations between physical behaviour patterns and levels of anxiety and depressive symptoms in middle-aged adults: An isotemporal substitution model.

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BACKGROUND

Physical activity has been identified as a protective factor against many adverse health outcomes including depression and anxiety. We aimed to examine the compositional effects of physical behaviour on mental health.

METHODS

Participants were 475 (59.7±5.5 years) middle-aged adults. Participants wore the wrist GENEActiv accelerometer for 7-consecutive days. Data were summarised into 60s epochs and activity categorised as sedentary behaviour, light or moderate-to-vigorous physical activity (MVPA) based on validated thresholds. Levels of depressive and anxiety symptoms were assessed using the Centre for Epidemiologic Studies Depression (CESD) scale and the Hospital Anxiety and Depression Scale (HADS) respectively. Single, partition and isotemporal substitution models were analysed.Isotemporal substitution analysis simultaneously models the specific activity being performed (light activity or MVPA) and the specific activity being displaced (sedentary behaviour) in an equal time-exchange manner.

RESULTS

In single model analysis, light activity was negatively associated with levels of anxiety (B=-0.06; 95% Confidence Interval (CI), -0.12 to -0.0002) and depressive symptoms (B=-0.17; 95%CI, -0.34 to -0.006). No significant associations were observed for sedentary behaviour and MVPA (P>0.05). Results of both partition and isotemperol models showed significant negative associations with levels of anxiety when 10 minutes of sedentary behaviour were substituted with 10 minutes of light activity (B=-0.08; 95%CI, -0.16 to -0.006 and B=-0.09; 95%CI, -0.16 to -0.009 respectively). No statistically significant associations were observed with levels of anxiety and depressive symptoms when sedentary behaviour was replaced with MVPA (P>0.05).

CONCLUSION

Substituting light activity for sedentary behaviour may have positive effects on depressive and anxiety symptoms among middle-aged adults.

P:16

Influence of weather conditions on hospital-treated self-harm in Ireland.

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Introduction

Internationally, self-harm is a major public health issue having a significant impact in terms of morbidity and mortality. Self-harm has been found to be a strong predictor of suicide. Research concerning the possible influence of weather on self-harm has produced limited and inconclusive results.

Methods

Data on self-harm presentations to all emergency departments (EDs) from 2010-2014 were obtained from the National Self-Harm Registry Ireland. Daily meteorological variables are gathered across all counties in Ireland by Met Eireann. Patient and weather data were matched based on closest weather station to a patient's residential address. Poisson regression analyses examined the association between daily self-harm and weather patterns.

Results

Between 2010 and 2014, 54,718 hospital-treated presentations made by 37,649 persons had applicable weather data. Overall, a one-unit increase in highest wind speed lasting greater than 10 minutes (kt) and highest measured gusts (kt) were associated with a 2.70% decrease and a 1.2% increase in daily self-harm incidence, respectively. Furthermore, a one-unit increase in sunshine duration (hr) and mean temperature (^{o}C) were associated with a 0.6% decrease and increase in daily self-harm incidence, respectively. Temperature was not to be associated with male self-harm incidence while no significant associations were observed with any weather factors for those older than 55 years and those younger than 30 years (except with wind gusts for those younger than 30 years).

Conclusion

Overall, findings suggest high wind speed for long periods, highest measured gusts, hours of sunshine and mean temperatures significantly impact self-harm.

P:17

An economic evaluation of a complex workplace dietary intervention

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Using evidence from the Food Choice at Work trial, this study employs an economic evaluation of nutrition education, environmental dietary modification and combined workplace interventions.

A baseline cost-utility (CUA) measured the cost-effectiveness of the dietary interventions in terms of QALYs. Sensitivity analyses tested the robustness of QALYs by performing cost-effectiveness analyses (CEA) using clinical measures to measure health outcomes. A cost-benefit analysis (CBA) employed the monetary value of absenteeism to report the net benefit of the intervention(s) compared to the control. Probabilistic sensitivity analysis (Monte Carlo simulation) assessed parameter uncertainty.

The baseline CUA indicated that each intervention (education (€37.85/QALY) environment (€5.88/QALY) and combined (€43.12/QALY)) is cost-effective relative to the control. Uncertainty in the incremental costs and effects translates into decision uncertainty for the environment intervention (50% probability of being cost-effective at €45,000/QALY threshold). However, at no point between a ceiling ratio of €0 to €100,000/QALY do the education or the combined interventions have a higher probability of being cost-effective than the control. Secondary CEA confirm the CUA results for each intervention. The environment intervention reported the lowest incremental cost-effectiveness ratios (ICERs) for: BMI (€14/kg/m^2), waist circumference (€3/cm) and weight (€7/kg). Furthermore, the environment intervention reported the highest positive net benefit of €145.82/employee.

Environmental dietary modification interventions offer a cost-effective approach for improving employee health. However, owing to uncertainty surrounding the extent of differences in health effects between the environment intervention and the control, it is imperative that future research employs long-term outcomes to avoid capturing mainly the initial high cost of intervention implementation.

P:18

Enablers and barriers to physical activity in overweight and obese pregnant women: an analysis informed by the Theoretical Domains Framework and COM-B model

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Background: Obesity during pregnancy is associated with increased risk of gestational diabetes mellitus and other complications. Although physical activity (PA) is a modifiable lifestyle factor that could help to prevent complications, many women reduce their activity levels during pregnancy. Some lifestyle interventions have been effective, however; they often fail to identify the underlying behaviour change mechanisms by which the intervention is expected to work.

Aim: Using behaviour change methods, the aim of this study is to identify the enablers and barriers to PA in overweight and obese pregnant women.

Methods: Semi-structured interviews were conducted with a purposive sample of overweight and obese women attending Cork University Maternity Hospital, Ireland until data saturation was achieved (n=30). Interviews were recorded and transcribed into NVivo V.10 software. The Framework approach was used for analysis, drawing on the Theoretical Domains Framework (TDF) and the COM-B model for behaviour change.

Results: Social opportunity was identified as an enabler of PA. Pregnant women suggested being active was easier when supported by their partners. Knowledge was recognised as both an enabler and a barrier. Some women were active because they were familiar with the health benefits, while others lacked information around safe activities in pregnancy. Physical capability and physical opportunity were also identified as barriers to PA; experiencing pain, a lack of time, having other children and working prevented women from being active.

Conclusion: The Behaviour Change Wheel will be used to identify intervention functions to inform the systematic development of a lifestyle intervention aimed at increasing physical activity for overweight and obese pregnant women.

P:19

Health care professional's experiences of lifestyle management in overweight and obese pregnant women: a qualitative study

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Introduction

Obesity during pregnancy is associated with a number of complications including gestational diabetes mellitus (GDM). Currently, little is known about guidelines in clinical practice and the challenges faced by heath care professionals (HCPs). The aim of this study is to explore HCPs experiences of lifestyle management for women who are overweight and obese in pregnancy with the view to informing the development of an antenatal lifestyle intervention.

Methods

Semi-structured interviews were conducted with a purposive sample of health care professionals (HCPs) from Cork University Maternity Hospital (CUMH) (n=10) and with a sample of General Practitioners (GPs) working in primary care in the region (n=7). The interviews were digitally recorded and transcribed into NVivo V.10 software. Thematic analysis is on-going.

Results

Preliminary results identified 'knowledge of weight management' and 'antenatal services' as key issues. A lack of knowledge was evident involving risks, complications and initiating a conversation around overweight and obesity in pregnancy. Variation exists around what is considered appropriate weight gain and whether HCPs were following any particular guidelines. Lifestyle factors were not routinely discussed with the women and furthermore, a lack of communication is very evident between HCPs in the hospital and GPs in terms of the services provided.

Conclusion

HCPs expressed challenges when communicating with their patients about weight management in pregnancy. By ensuring midwives and other HCPs have the knowledge, skills and opportunity to discuss weight and lifestyle factors with pregnant women, the women in turn may be more motivated to maintain a healthy behaviour's during pregnancy.

P:20

Antimicrobial susceptibility of Long Term Care Facility and General Practice urine samples in the greater Cork region.

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Background:

Urinary tract infections (UTI) are one the leading causes of infection and antimicrobial prescribing in long term care facilities (LTCFs). The study aim was to investigate recent patterns of antimicrobial susceptibility in urine samples submitted to the Microbiology Laboratory at Cork University Hospital (CUH) from LTCFs in the greater Cork region. This study also aimed to compare the antimicrobial susceptibilities of urine samples in the LTCF setting to those of patients >65 years sent to CUH by General Practitioners (GPs).

Methods:

A retrospective analysis of the antimicrobial susceptibilities of urine samples submitted to the microbiology laboratory at CUH in quarter one of 2011 to 2014 was conducted. LTCF and primary care susceptibilities were compared using Chi square statistics. Ethical approval was obtained.

Results:

4,256 samples were included. Overall, the LTCF urine samples were less susceptible than GP urine samples to the antimicrobials recommended in the national urinary tract infection guidelines trimethoprim, nitrofurantoin, cephalexin, co-amoxiclav, ciprofloxacin and amoxicillin ($p<0.001$). Important trends in antimicrobial susceptibility over the time period were noted. A significant reduction in susceptibility to co-amoxiclav was found between Q1 2011 and Q1 2014 in both settings (GP $p = 0.013$, LTCF $p = 0.005$).

Conclusions:

This study provides important information which will contribute to the revision of guidelines in the future. This study highlights the need for continuous surveillance of antimicrobial susceptibility trends in LTCFs. Regular surveillance and updates of patterns of antimicrobial susceptibility in LTCFs is necessary to implement strategies to minimise the risk of AMR in LTCF residents.

P:21

Exploring the Housing Needs of Older People in Social Housing: A Comparative Survey of Those Living in 'Mainstream' or 'Sheltered' Homes.

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Background: The house we live in and where we live has a major impact on our physical and mental health; this is particularly true for older people who may spend more time at home. Older people living in social housing are even more vulnerable, being at risk of poorer health and lower life-expectancy. With an ageing population, it's critical that the most suitable housing model is identified. However, it's unclear whether supporting people in their own homes ('ageing-in-place') or in specially designed 'sheltered' accommodation is preferential. Research aim: to explore the housing needs of older people in social housing, comparing those in mainstream or sheltered schemes.

Methods: The population was tenants of Clúid Housing aged >59 years. Two surveys were designed, for 'mainstream' or 'sheltered' social housing tenants. A stratified sampling method was used to reach a geographically representative sample across Ireland.

Results: The response rate was 47.2% (n=380/805). Older people across the schemes had similar housing needs. Unsuitable homes led to fear and anxiety, especially around using the bathroom and stairs. One-in-four experienced fuel poverty. Tenants in mainstream housing were less likely to have necessary adaptations in place. Sheltered housing tenants were happier with their home (90% 'completely' or 'somewhat' satisfied) and had more social contact.

Conclusions: Tenants living in mainstream houses reported more disability/illnesses, worried more about the future, and felt less safe in their neighbourhood, than those in sheltered housing. However, few wanted to move. Overall there was a lack of knowledge among older people about housing and support options.

P:22

A Qualitative Exploration of the Housing Needs of Marginalised Older People in Social Housing: Focus-Groups with 'Mainstream' and 'Sheltered' Tenants

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Background: It's unclear what is the 'best' model of housing provision for older people: 'ageing-in-place' in the community or 'sheltered' housing schemes, specially designed for older or disabled people. Older people living in social housing are more vulnerable than those in the general population; it is particularly important to identify the housing model that best meets their needs. We therefore designed a focus-group study to explore:1. What are the main housing and support needs of older people? 2. Which housing model is best suited to meeting these needs?

Methods: The population was older tenants in Cluid Housing. A schedule was developed, and focus-groups were facilitated by two researchers, audio-recorded, and analysed with Content Analysis using NViVo 10.0.

Results: Thirty-one people participated in six focus-groups, ('sheltered' n=3; 'mainstream' n=3). Overall, 16 were female; the average age was 72 years (range 60-96 years). Most older people in both mainstream and sheltered housing were very happy with their home. Those in mainstream housing were happy with the quality of their home and age-mix of neighbours. Few wanted to move. Those in sheltered housing had even higher levels of satisfaction. Perceived benefits of sheltered accommodation included: houses are adapted for older/disabled people; increased social contact; support from local Clúid staff; increased safety and security.

Conclusions: Older people may be supported to live either in the community or in sheltered accommodation, provided that necessary physical adaptations and social supports are in place. Sheltered housing may be appropriate for people who feel particularly vulnerable and would value extra support.

P:23

PINK1 activation of PI3-Kinase/Akt – understanding mechanisms which lead to Parkinson's disease.

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The PI3-kinase/Akt pathway is a signalling hub for cell survival and health. Studies, from our and other labs, show that aberrant activity of Akt is strongly implicated in Alzheimer's and Parkinson's disease (PD). Moreover, accumulating evidence indicates that PD-causing genes, including the autosomal recessive inherited gene *PINK1* (PTEN-induced putative kinase-1), may protect neurons from PD via PI3-kinase/Akt activation. However, mechanisms underlying PINK1's function in PI3-kinase/Akt signalling remain unclear. Here, we show that PINK1 deletion significantly reduced Akt activation (phospho-Akt^{Ser473}/Akt and phospho-Akt^{Thr308}/Akt ratios) in immortalised mouse embryonic fibroblasts (MEFs) from PINK1$^{-/-}$ mice; this was restored by humanPINK1 overexpression and was partially PINK1 kinase dependent. PINK1 deletion had no significant effect on Akt 1,2, or 3 isoform levels, thus PINK1 specifically regulates Akt activation. Under stress conditions in the absence of growth factors, Akt was constitutively activated at Ser473 and Thr308 phosphorylation sites upon hPINK1 overexpression, whereas no Akt activation was detected in PINK1$^{+/+}$, PINK1$^{-/-}$ or PINK1 kinase dead MEFs. Constitutive activation of Akt by hPINK1 was not due to alterations in PTEN levels, the major negative regulator of Akt, or PINK1-induced activation of PDK-1 the Akt, Thr308-kinase. However, our results show for the first time that PINK1 regulates the localisation and trafficking of PIP_3(phosphatidylinositol (3,4,5)-trisphosphate) a lipid whose increased abundance at the plasma membrane is essential for Akt activation. Together, our findings indicate that PINK1 is a primary activator of Akt via modulation of PIP_3, highlighting novel components of PINK1-Akt signaling that increase understanding of PD and expose targets for its treatment.

P:24

Cost of Care Knowledge in Hospital Organisations

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Introduction: Hospitals are facing increased pressures to control expenditure while maintaining quality of care in clinical services. Clinicians are the main drivers of non-pay expenditure in healthcare, with their decision-making estimated to account for up to 70 percent of non-pay expenditure. UK and US papers dominate the literature on clinicians' cost awareness. This research shows that clinicians have a poor knowledge of the cost of the resources they use. In addition, this research suggests that up to 30 percent of healthcare interventions are either unnecessary or of no benefit to patients thus contributing to resource inefficiency and low-value care.

Aim: To evaluate the level of cost awareness of commonly ordered investigations amongst non-consultant hospital doctors (NCHDs) in Ireland.

Methods: An electronic survey was designed and sent to 260 NCHDsin a large, acute, public hospital in Ireland. Participants were asked to (i) estimate costs of commonly ordered laboratory and radiological diagnostic tests and (ii) select diagnostic tests for 7 commonly encountered clinical vignettes.

Results: Cost estimates of commonly ordered laboratory and radiological interventions showed considerable variable with 86.2 percent of 4,227 estimates being incorrect. For the common clinical vignettes, 77 percent of surveyed NCHDs requested unnecessary tests, the cost estimates for such orders being €2,794 per 100 patient episodes.

Conclusion: The majority of NCHDs select tests of low yield in commonly ordered encountered clinical scenarios, with resultant significant cost and resource implications. NCHDs recognise the need to be resource-efficient and would broadly welcome interventions aimed at improving cost of care knowledge amongst clinicians.

P:25

Lung Cancer Immunotherapy utilising EEV plasmid to upregulate IL-12 expression in combination with Immune checkpoint Inhibitors

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We have developed a DNA plasmid, pEEV that enables the enhanced expression of exogenous genes in transfected cancer cells. Previously, we have shown that delivery of our EEV plasmid (pEEV) via electroporation is capable of achieving reliable and superior expression in a variety of murine and porcine tissue types when compare with a control plasmid (1). In this research project we investigated the expression of IL-12 via this enhanced pEEV plasmid compared to standard plasmids and its synergistic effect in combination with Anti-PD-1 immunotherapy.

Methods and materials:

C57 mice were inoculated with Lewis Lung cancer cells. The tumours were treated once they reached 0.5x0.5 cm . The treatments groups had EEV IL-12 plasmid or pORF IL-12 injected into the tumours,were electroporated at the tummour site 5minutes later and received Invivo-mab anitbody at D0, D1 and D4.

Results: We demonstrated that the pEEV treatment group had a marked increase in the expression of IL-12 compared to standard plasmid.

P:26

Determining the role of laparoscopic lymph node biopsy for the diagnosis of isolated abdominal lymphadenopathy.

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Background: Intra abdominal lymphadenopathy is frequently detected and challenging to biopsy. In situations where percutaneous biopsy is unsuccessful or impossible, laparoscopic lymph node biopsy is often undertaken. **Methods:** In this retrospective study we identified all patients who had undergone diagnostic laparoscopic biopsy for isolated intra abdominal lymphadenopathy at our institute from 2008 to 2016. **Results:** A total of 36 patients underwent laparoscopic biopsy for abdominal lymphadenopathy of unknown etiology. Most of these patients had undergone numerous previous investigations including a previous failed percutaneous biopsy in 11 patients. Of the 36 patients who underwent laparoscopic biopsy 16 were diagnosed with lymphoma, 12 with benign lymphadenopathy, 7 with a non-haematological malignancy and 1 was diagnosed with sarcoidosis. All of the patients who underwent laparoscopic biopsy had a definitive diagnosis post operatively and in all cases sufficient tissue was present for ancillary molecular diagnostic studies. Operatively no patients suffered any major complications and no mortality was reported. Additionally no cases were converted to open laparotomy. **Conclusions:** This case series suggests that laparoscopic lymph node biopsy for isolated abdominal lymphadenopathy is a safe and accurate diagnostic procedure. This is the first case series of laparoscopic biopsy for the diagnosis of abdominal lymphadenopathy to be reported for Ireland or the United Kingdom. Future work will focus on comparing the accuracy of laparoscopic biopsy to core needle biopsy as well as the use of PET-CT guided laparoscopic biopsy.

P:27

Combination of electroporation delivered metabolic inhibition with low dose chemotherapy in osteosarcoma

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Osteosarcoma is the most common (75%) high-grade malignant tumour of the skeletal system in patients aged between 10-25 years, with an annual incidence of 1-3 cases per 1 million people.

Current management strategy for newly diagnosed osteosarcoma includes neoadjuvant therapy followed by surgical removal of the primary tumour along with clinically evident metastastic disease, and the addition of adjuvant chemotherapy. The high mortality rates in OS are largely a result of both intrinsic and acquired resistance (60%) to currently used polychemotherapies that lead to multidrug resistant phenotypes and the occurrence of 'second malignancies'. Neoadjuvant chemotherapy has not been shown to improve long-term prognosis of patients compared to adjuvant chemotherapy alone. High dose chemotherapies lead to local and systemic side effects. Attempts to improve therapy efficacy by dose escalation, alterations in combinations of chemotherapy and irradiation therapy have not improved survival outcomes.

Therapy efficacy and survival outcome could potentially be increased by methods of subverting therapy resistance and re-establishing sensitivity of osteosarcoma to existing treatments. While tremendous progress has been made in the treatment of osteosarcoma, there is a critical need for the development of novel therapies to improve patient survival.

Electroporation is a non-thermal, cell permeabilising technology that renders the treated cell membranes permeable to poorly permeant anti-cancer drugs thus facilitating a potent local cytotoxic effect from the improved cell membrane porosity. Electrochemotherapy combines electroporation and local or systemically administered chemotherapeutic agents.

Metabolic modulators in combination with chemotherapy has been shown to be effective in cancer treatment, due to increase sensitivity of cancer cells from depletion of intracellular ATP levels from glycolytic inhibition.

P:28

From research into actions: Findings from the National Self-Harm Registry Ireland

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The National Self-Harm Registry Ireland is a national surveillance system for the monitoring of hospital-treated self-harm. The Registry is funded by the HSE's National Office for Suicide Prevention and is recognised by the World Health Organisation as a template for self-harm surveillance globally.

Rates of self-harm are consistently higher among young people, in deprived and urban areas. Furthermore, self-harm is often associated with substance, particularly alcohol, misuse. These findings highlight the challenges faced by health services in responding to self-harm, engaging vulnerable populations and tackling health inequalities.

From a public health perspective, the Registry provides a unique opportunity to determine and monitor the incidence and repetition of self-harm. Data from the Registry have been used to inform national suicide prevention initiatives, service provision, resource deployment and the development of national guidelines for the management of self-harm in clinical settings. To this end, data are used by a range of stakeholders including governmental agencies, clinical staff and health care workers, international agencies and the research community. The use of standardised inclusion criteria and operational definitions has also allowed for cross-country comparisons with similar systems.

Specifically, Registry outcomes have been used to inform the national suicide prevention strategy *Connecting For Life* (2015-2000) and will form part of the strategy's outcomes framework. The Registry has informed a number of projects, including the National Dialectical Behavioural Therapy Project Ireland and a successful five-year Health Research Board Leader's Programme which aims to improve care and reduce repetition among self-harm patients.

P:29

SH-SY5Y cell model: differentiation and neuroprotection

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Being the second most prevalent neurodegenerative disorder in the world, it is alarming that for the last six decades, therapy for Parkinson's disease (PD) has consisted mainly of symptomatic treatment which does not interrupt or slow down the progression of the disease. However, in spite of the lack of clinical changes, research has been far from stagnant. Neurotrophic factors - proteins which play critical roles in nervous system development and cell survival - have shown promising results in promoting cell survival in models of Parkinson's Disease. One of the many research models is the use of the SH-SY5Y human neuroblastoma cell line that can be differentiated into stereotypical dopaminergic neurone type through treatment with retinoic acid or 12-tetradecanoyl-13-acetyl-beta-phorbol (TPA). Subsequently, PD degeneration can be mimicked by chemical insult with 6-hydroxidopamine (6-OHDA) then allowing assays on neuroprotection and neurorescue. Using this model, the objectives of this work are to evaluate the best conditions for differentiation, neuroprotection and neurorescue using GDNF, GDF-5, Neurturin, MANF and CDNF. Once each growth factor is assessed individually, we will test combinations of growth factors providing optimal SH-SY5Y cell line neuroprotection.

P:30

The influence of potentially inappropriate medications on healthcare utilization and medication use: a retrospective cross-sectional study

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Background: The Screening Tool for Older Persons Prescriptions (STOPP)[1] has been developed and validated to identify PIMs in older people (>65 years). Based on longitudinal data from a primary care cohort[2] this study aims to describe the long-term effect of PIMs on medication use and healthcare services utilisation.

Methods: A subset of the STOPP criteria were applied to baseline data and those with and without PIMs were identified. Relevant information on prescribed medicines and healthcare services use were extracted from patient records from 2011 to 2015. Healthcare services utilisation and medication use by participants with PIMs versus no PIMs was compared using Poisson and negative binomial regression models for non-dispersed data and over-dispersed data, respectively. The results are presented as incident rate ratios (IRR) with 95% confidence intervals. The models were adjusted for age, gender, number of medications, comorbidities and private health insurance status.

Results: From the cohort, 556 participants were included in this study. PIMs were prescribed to 275 (49.4%) of the participants. There was no significant difference in gender (p=0.606) and age (p=0.769) between PIM and non-PIM participants. PIM participants were prescribed significantly more medicines (median 10, IQR 8.5-11) compared to non-PIM participants (median 5, IQR 4-5) for the follow-up period (IRR ranging from 1.12-1.22, $p<0.05$). There was no significant difference in the use of healthcare services between the groups.

Conclusions: Patients prescribed PIMs are likely to be prescribed a higher number of medications. No association was found between being prescribed a PIM and healthcare services utilisation.

P:31

A Clinical and Genetic Study of Myofibrillar Myopathy

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Myofibrillar myopathy (MFM) is a group of genetic muscular dystrophies with a distinct pattern of myofibrillar dissolution caused by defects at the Z-disk of the muscle fibres. Clinical features vary but include progressive muscle weakness in approximately 80%, cardiomyopathy in 15-30% and peripheral neuropathy in 20% of affected individuals. MFM is diagnosed based on clinical, neurophysiological and neuropathological findings. Most patients experience walking difficulties, some eventually requiring wheelchair use. In cases with cardiomyopathy, interventions such as pacemaker or implantable defibrillator may be indicated. The disease is predominantly inherited in an autosomal dominant manner and mutations have been identified in a number of genes encoding Z-disk proteins. We recruited MFM patients (n=8) and unaffected relatives (n=3) believed to be part of an extended Cork family.

The project has two aims. First, to generate a detailed clinical phenotype of MFM by neurological examination and review of medical records. Second, to identify the disease-causing mutation by screening MFM gene(s) in the DNA of patients. All patients have had detailed recording of clinical and phenotypic data. There was no evidence of ZASP gene screening, therefore patient DNA samples were screened and a disease-segregating ZASP mutation was detected.

The clinical and genetic information collated is of value in directing treatment and management of patients, documenting disease course and severity and permitting testing of at-risk individuals. Future work will include genetic analysis to determine if these patients are related.

P:32

Risk indicators associated with root caries in independently living older adults

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Objective: To determine the risk indicators associated with root caries experience in a cohort of independently living older adults in Ireland.
Methods: The data reported in the present study were obtained from a prospective longitudinal study conducted in a cohort of independently living older adults (n=334). Each subject underwent an oral examination, performed by a single calibrated examiner, to determine the root caries index and other clinical variables. Questionnaires were used to collect data on oral hygiene habits, diet, smoking and alcohol habits and education level. A regression analysis with the outcome variable of root caries experience (no/yes) was conducted.
Results: A total of 334 older dentate adults with a mean age of 69.1 years were examined. 53.3% had at least one filled or decayed root surface. The median root caries index was 3.13 (IQR 0.00, 13.92). The results from the multivariate regression analysis indicated that individuals with poor plaque control (OR 9.59, 95%CI 3.84-24.00), xerostomia (OR 18.49, 95%CI 2.00-172.80), two or more teeth with coronal decay (OR 4.50, 95% CI 2.02-10.02) and 37 or more exposed root surfaces (OR 5.48, 95% CI 2.49-12.01) were more likely to have been affected by root caries.
Conclusions: The prevalence of root caries was high. This study suggests a correlation between root caries and the variables poor plaque control, xerostomia, coronal decay (≥2 teeth affected) and exposed root surfaces (≥37). The significance of these risk indicators and the resulting prediction model should be further evaluated in a prospective study of root caries incidence.

P:33

Dietary intakes of polyphenols and food sources in Ireland.

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A diet high in polyphenols has been shown to reduce the risk of cardiovascular disease (CVD) (1). Polyphenols can improve the health of an individual, therefore recommended daily intakes (RDIs) should be considered (2). The dietary exposure within the general population must be assessed through validated and accurate assessments to establish a RDI (3). The aim of the present study was to assess the current intakes of polyphenol-containing foods within Irish adults, teens and children.

Nationally representative data from the Irish Universities Nutrition Alliance (IUNA) dietary surveys were utilised, including the National Adults Nutrition Survey (NANS) (19-90y, N=1500), National Teens Food Survey (NTFS) (13-17y, N=441) and National Children's Food Survey (NCFS) (5-12y, N=594). Using Crème Global© software and the Phenol-Explore database (http://phenol-explorer.eu/), the mean daily intakes (MDI), polyphenol intakes and the number (%) of consumers of each polyphenol containing food were calculated.

The mean (SD) total polyphenol intake within Irish adults was 548 (247) mg/day, teens 370(295) mg/day and children 276 (187) mg/day. The main foods contributing to polyphenol intakes within Irish adults and teens were tea and coffee. In Irish children the main sources of polyphenols came from apple juice and tea. Apples were the main non-beverage source contributing to total daily polyphenol intakes.

This study is the first that uses nationally represented data to estimate polyphenol intakes.in the Irish population. Beverages were the main food group contributor to total polyphenol intakes suggesting that beverages could be an optimium medium by which to increase polyphenol intakes within a population.

P:34

Post-Transcriptional Checkpoints in the Microbiome-Gut-Brain Axis: Evidence for Microbial Regulation of microRNA Expression in the Amygdala and Prefrontal Cortex

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The gut microbiome has been associated with many psychiatric and neurological disorders. Preclinical studies using germ-free (GF) animals have been essential in our current understanding of the potential importance of the host microbiome for neurodevelopment and behaviour. In particular, it has been repeatedly demonstrated that manipulation of the gut microbiome modulates anxiety-like behaviours. The neural circuits that underlie anxiety and fear-related behaviours are complex and heavily depend on functional communication between the amygdala and prefrontal cortex (PFC). Previously we have shown that the transcriptional network within the amygdala and PFC of GF mice are altered. microRNA (miRNA)s act through translational repression to control gene translation, have also been implicated in anxiety-like behaviours. However, it is unknown whether these features of host post-transcriptional machinery are also recruited by the gut microbiome to exert control over CNS transcriptional networks. We conducted illumina® next generation sequencing (NGS) in the amygdala and PFC of conventional, GF and germ-free colonized mice (exGF). We found a large proportion of miRNAs to be dysregulated in GF animals in both brain regions (103 in the amygdala and 31 in the PFC). Additionally colonization of GF mice normalized some of the noted alterations. Next we manipulates the adult microbiome with administration of both prebiotics (GOS & FOS) and antibiotic cocktail and found that they also impacted on the expression of relevant miRNAs. These results suggest that the microbiome is necessary for appropriate regulation of miRNA expression in brain regions implicated in anxiety-like behaviours.

P:35

Understanding Neurophobia: Reasons behind Impaired Understanding and Learning of Neuroanatomy in Cross-Disciplinary Healthcare Students

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Recent studies have highlighted a fear or difficulty with the study and understanding of neuroanatomy among medical and other healthcare students. This has been linked with a diminished confidence of clinical practitioners and students to manage patients with neurological conditions. We queried the underlying reasons for this difficulty amongst a broad cohort of medical, dental, occupational and speech and language sciences students. Our study provides direct evidence of the students' perception regarding specific difficulties associated with learning neuroanatomy and identifies measures required to address those issues. Results show that neuroanatomy is perceived as a more difficult subject compared to other anatomy topics (e.g. reproductive/pelvic anatomy or head and neck anatomy) and that not all components of the neuroanatomy curriculum are viewed as equally challenging. The difficulty in understanding neuroanatomical concepts is linked to intrinsic factors such as the inherent complex nature of the topic rather than outside influences (e.g. lecture duration). Participants reporting high levels of interest in the subject also reported high levels of knowledge, suggesting that developing teaching tools aimed at increasing interest, such as case-based scenarios, would facilitate acquisition of knowledge. Newer pedagogies, including web-resources and computer assisted learning (CAL) are considered important tools to improve neuroanatomy learning, whereas traditional tools such as power-point and lecture notes were considered less important. We conclude that purpose-designed CAL and online resources could enhance neuroanatomy understanding and decrease the neurophobia. Our data will inform curricular design to re-focus attention and guide educators to develop improved neuroanatomy web-resources in future.

P:36

Lactobacillus rhamnosus (JB-1): A psychobiotic lost in translation?

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Background: Preclinical studies have identified certain probiotics as psychobiotics - live microorganisms with a potential mental health benefit. *Lactobacillus rhamnosus* (JB-1)has been shown to reduce stress-related behaviour, corticosterone release and alter central expression of GABA receptors in mice. It is unclear if this single putative psychobiotic strain has psychotropic activity in humans.

Objectives: To determine the impact of *L. rhamnosus* on stress-related behaviours, physiology, inflammatory response, cognitive performance and brain activity patterns in healthy male participants.

Methods: An 8 week, randomized, placebo-controlled, cross-over design was employed. Twenty- nine healthy male volunteers participated. Participants completed self-report stress measures, cognitive assessments and resting electroencephalography (EEG). Plasma IL10, IL1β, IL6, IL8 and TNFα levels were determined by multiplex ELISA. Salivary cortisol was determined by ELISA and subjective stress measures were assessed before, during and after a socially evaluated cold pressor test (SECPT).

Results: There was no overall effect of probiotic treatment on measures of mood, anxiety, stress or sleep quality and no significant effect of probiotic over placebo on subjective stress measures, or the HPA response to the SECPT. Visuospatial memory performance, attention switching, rapid visual information processing, emotion recognition and associated EEG measures did not show improvement over placebo. No significant anti-inflammatory effects were seen as assessed by cytokine levels.

Conclusions: *L. rhamnosus* was not superior to placebo in modifying stress-related measures, HPA response, inflammation or cognitive performance. These findings highlight the challenges associated with moving promising preclinical studies from bench to bedside.

P:37

Knowledge, attitudes and beliefs of Irish parents regarding fever in children: an interview study

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Background
Fever is one of the most common childhood symptoms. It causes considerable anxiety and worry for parents. The aim of this study is to describe parental knowledge, attitudes and beliefs regarding their experiences in management of childhood fever in children aged five years and under.

Methods
A phenomenological approach was used to explore the lived experiences of parents when caring for a febrile child. Ethical approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals prior to initialising the study. Semi-structured interviews were conducted with 23 parents at community outreach ante-natal clinics in the Cork area during March and April 2015. The Francis method was used to establish data saturation. Thematic analysis was used to analyse the data.

Results
Twenty three parents contributed to the study. Five themes emerged from the data: assessing and managing the fever; parental knowledge and beliefs regarding fever; knowledge source; pharmaceutical products; initiatives. Whilst parents showed a good knowledge of fever as a symptom, nonetheless, management practices varied between participants. Parents frequently sought information and reassurance from healthcare professionals. There was a desire for more accessible, consistent information to be made available for use by parents when their child had a fever or febrile illness.

Conclusion
Providing further resources for parents coupled with effective communication are gaining greater importance as time allotted for health care visits decreases. The accessible nature and location of pharmacies could provide useful support for both parents and General Practitioners.

P:38

Parental fever knowledge: opportunities for healthcare professionals

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Background

Fever, despite being one of the most common childhood symptoms, causes undue concern for parents. The aim of this study was to describe parental knowledge, attitudes and beliefs regarding fever in children aged five years of age and younger.

Methods

Ethical approval was granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals prior to starting the study. Data for this study were collected at purposively selected primary schools in the Cork area and from a cross-sectional internet based study using a convenience sample of parents via websites and web pages previously identified in an interview study. The questionnaire administered in this study was developed and used in previous research. Respondents' answers analysed using SPSS version 22.0 (SPSS, Inc., Chicago IL).

Results

Overall 1104 parents contributed to this research. Almost two thirds of parents (60.4%, n=667) were worried about the consequences of fever in general, while only 27.2% of parents (n=301) were of the opinion that fever may be beneficial to their child's health. Almost two thirds of parents (63.1%, n=695) identified temperatures at which they define fever that were either below or above correct definition of temperature ($38^{O}C$).

Conclusion

Parental knowledge concerning fever as a symptom and fever management was found to be deficient. Opportunities to engage with parents when attending healthcare professionals must be used to elucidate what parents already know and to provide parents with relevant and timely information on how to manage the symptom.

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Bridging the mHealth Knowledge Gap – Developing a Training Programme for Primary Healthcare workers in Enugu State, Nigeria

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Mobile health (mHealth) interventions can vastly improve the quality and efficiency of healthcare services delivered by Primary Healthcare (PHC) workers in developing countries such as Nigeria. However, while these PHC workers are often educated, recent resourcing limitations has meant that training in new technical innovations for assisting with patient assessment, classification, and treatment (i.e. mHealth), has not been widely available to this cadre of healthcare worker. To ensure the successful adoption, continued use, and eventual diffusion of mHealth interventions, it is imperative to adequately train PHC workers in the use of new technologies. The IMPACT (usIng Mobile Phones for Assessing, Classifying and Treating sick children) project explores the feasibility of introducing an mHealth application in Nigeria. The first phase of the project conducted focus groups to explore PHC workers' current understanding of the potential of an mHealth application to aid them in assessing, classifying, and treating young children. Based on the current knowledge levels, the study will develop a comprehensive training needs framework to bridge PHC workers' knowledge deficit. The mHealth training framework will inform the development of a specialised training plan and training resources called "IMPACTeD". This training programme will be implemented among PHC workers in five communities in Enugu State, Nigeria as part of the Phase 2 of the project in January 2017. This research promises important translational impacts by equipping PHC workers with the knowledge and skills necessary to effectively utilise the IMPACT application, thereby improving the delivery of healthcare services to young children in Nigeria.

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Appropriate use criteria for transthoracic echocardiography in clinical practice: a retrospective report from Cork University Hospital.

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Background: In response to concerns regarding unnecessary transthoracic echocardiogram (TTE) requests the 2011 Appropriate Use Criteria (AUC) were developed by the American College of Cardiology (ACCF) in collaboration with other subspecialty societies. When applied to multiple centres both in the United States (US) and overseas, the rates of inappropriate referrals were as high as 22% and 20% respectively.

Methods: A retrospective analysis of TTE referrals for appropriateness and major abnormality detection was conducted over a two-month period at Cork University Hospital (CUH).

Results: Overall, 1277 requests were assessed, of which 97.7% were classifiable. Of the 1235 classifiable studies, 1049 (84.9%) were appropriate, 135 (10.9%) were inappropriate and 51 (4.1%) were uncertain. Main indications were the evaluation of: cardiac structure and function (496, 40.2%), hypertension, heart failure or cardiomyopathy (349, 28.3%) and valvular function (228, 18.5%). Inappropriate referral rates were significantly higher for outpatients (13.8 % vs. 7.1%, $p < 0.05$) and Cardiologist referrals (13.1 vs. 8.0%, $p < 0.05$) while one in three requests for the evaluation of valvular function (32.5%) were inappropriate. A total of 623 major abnormalities were identified from 395 patients (32.0%). Compared to inappropriate studies, appropriate and uncertain scans had a greater prevalence of ≥1 major abnormalities (33.6% vs. 19.3%, $p < 0.001$) and greater detection rates of new abnormalities (27.6% vs. 13.3%, $p < 0.001$).

Conclusion: Application of AUC to our centre was feasible and a strict adherence to said criteria would have reduced the number of adult TTEs performed by ~930 per year.

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What drives Dietary Patterns on the Island of Ireland?

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The increase of chronic diseases such as IHD, due to the level of consumption of saturated fats, and diabetes linked to obesity, has led to diet becoming an important issue within public health (Whelton et al., 2007, DOHC, 2005). The nutritional approach taken in this case is to be one of informing the public. One response to this has been to statistically examine surveys of family eating habits and to characterise typical dietary patterns, as 'healthy' or 'unhealthy' on a nutritional basis. This provides some indication of the best form and target of any public health campaign. It is instructive to contrast the nutrition approach with that of economics. Engel's Law states that the share of food in a household's budget declines with its income has. The functional relation between expenditure on a particular food item and income is reflected in an Engel curve. The objective of this paper is to synthesise the approach of economics and nutrition. A key strength of the latter approach is the recognition that preferences differ between households. Clearly from the public health perspective the nutritional quality of diet is central. The policy challenge after establishing the various dietary patterns is to attempt to lever households from the unhealthy to the healthy alternative. A major criticism of this approach is the inclusion of income in the determinants of the dietary pattern. Therefore preferences and income were accounted for and results showed the importance of the demographic structure of a household.

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SOMETHING OLD, SOMETHING NEW! OAC PRESCRIBING BEHAVIOUR

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Prescribing anticoagulants is becoming more challenging as more drugs enter the market. For many prescribers warfarin has dominated the market although it is not without its issues, with a narrow therapeutic range and increased bleeding risk it requires monitoring. The release of new oral anticoagulants or NOACs offers a wider choice but are costly and have complex polypharmacy considerations. Many studies have analysed GP prescribing behaviour across all medicines and new drugs across a variety of public health care systems such as Greece (Theodorou et al (2009) and the UK (Bradley, 1992). More specifically, previous research indicates that the uptake of new drugs is influenced by GP characteristics. Given, that 46% of Irish GPs revealed that they have been an initial prescriber of NOACs (Murphy, Kirby and Bradley 2016) and that only 82% of initiating prescribers of NOACs ranked renal impairment as important this result warranted further investigation into GP's prescribing behaviours. This paper investigated the “knowledge level” amongst Irish GPs who prescribe anticoagulants (including NOACs) and care for AF patients receiving anticoagulation therapy and the factors influencing their decision to prescribe anticoagulants. This paper found that it is imperative that those who are prescribing NOACs and caring for NOAC patients receive adequate education. Furthermore, it is essential that prescribers prescribe the appropriate anticoagulant on a per patient basis and provide suitable monitoring and maintenance.

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Exercise and social interaction influence hippocampal neurogenesis in adolescent mice

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Adolescence is a sensitive period of neurodevelopment during which life experiences and the surrounding environment can have profound effects on the brain. Neurogenesis is a neurodevelopmental process of generating functional neurons from neural stem cells which occurs throughout the lifespan in the hippocampus. Adult hippocampal neurogenesis has been shown to play a role in learning and memory and in mood regulation. It has also been shown to be influenced by environmental factors such as exercise and stress in the adult. Intrinsic factors that regulate hippocampal neurogenesis include the orphan nuclear receptor TLX (Nr2e1) which is primarily expressed in neurogenic niches of brain. While mechanisms regulating adult neurogenesis have been widely studied, less is known however on how neurogenesis is affected during the adolescent period. The aim of this study was to investigate the influence of social isolation stress on exercise-induced increase in neurogenesis during adolescence and to determine a role for its intrinsic regulation by TLX. Single or pair-housed wild-type mice were housed in sedentary conditions or allowed free access to running wheels for 3 weeks during the adolescent period. We demonstrate that social isolation of mice during adolescence does not impact upon hippocampal neurogenesis, as determined by immunohistochemical analysis of the survival of newborn neurons. However, social isolation prevents an exercise-induced increase in hippocampal neurogenesis in these mice. Furthermore, we show that there is no increase in neurogenesis in Nr2e1 -/- mice with access to running wheels, which suggests that TLX is necessary for the pro-neurogenic effects of exercise.

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Morphological Aspects of Syncytiotrophoblast Nuclear Organization Patterns in the Human Placenta

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Preeclampsia and intrauterine growth restriction are two of the most important pregnancy complications worldwide and have been associated with abnormalities in placental trophoblast turnover. Histological evidence shows that syncytiotrophoblast nuclei form specific spatial arrangements and patterns that influence the pathological appearance of some diseased placentas. It is not known whether links exist between these nuclear organisational patterns and how trophoblast cell turnover is organised and controlled.

SUN-KASH proteins are nuclear-envelope bridges responsible for the physical links between nuclei and the cytoskeleton and are required for nuclear organisation in a variety of cells. They are known to play a role in cell turnover and have been implicated in human diseases. These include the laminopathies, some of which affect another syncytium, human skeletal muscle. We propose that the SUN-KASH proteins, through their cytoskeletal interactions, are involved in syncytiotrophoblast nuclear organisation and regulation of their turnover. To examine this hypothesis we established a novel placental sampling method, fine needle aspiration, and compared it to the usual tissue block processing. Using immunohistochemistry to detect the SUN-KASH proteins and confocal laser scanning microscopy (CLSM), we show that this new method allows faster analysis of large numbers of placental villi, reduces the need to scan large areas of tissue and can be rendered in three dimensions using CLSM. Furthermore, we show that the SUN proteins SUN1 and SUN2 as well as the KASH proteins SYNE1 and SYNE2 are expressed at the nuclear envelope of the trophoblastic syncytium.

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STOPPFrail (Screening Tool of Older Persons Prescriptions in Frail Adults with Limited Life Expectancy): Consensus Validation

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Introduction

To validate STOPPFrail, a list of explicit criteria for potentially inappropriate medications (PIMs) in frailer older adults with limited life expectancy. A Delphi consensus survey of an expert panel (n=17) comprising specialists in geriatric medicine, clinical pharmacology, palliative care, psychiatry of old age, clinical pharmacy and general practice.

Methods

STOPPFrail criteria was initially created by the authors based on clinical experience and appraisal of the available literature. Criteria<ins cite="mailto:uccadmin" datetime="2016-05-10T21:51"> </ins>were organised according to physiological system. Each criterion<ins cite="mailto:uccadmin" datetime="2016-05-10T21:52"> </ins>was accompanied by an explanation. Panellists ranked their agreement with each criterion on a 5-point Likert scale and invited to provide written feedback. Criteria with a median Likert response of 4/5 (agree/strongly agree) and a 25th centile of ≥4 were included in the final criteria.

Results

Three Delphi rounds were required. All panellists completed all rounds. Thirty criteria<ins cite="mailto:uccadmin" datetime="2016-05-10T21:53"> </ins>were proposed for inclusion; 27 were accepted. No new criteria<ins cite="mailto:uccadmin" datetime="2016-05-10T21:53"> </ins>were added. The first two criteria<ins cite="mailto:uccadmin" datetime="2016-05-10T21:53"> </ins>suggest deprescribing medications with no indication or where compliance is poor. The remaining 24 criteria<ins cite="mailto:uccadmin" datetime="2016-05-10T21:53"> </ins>include lipid-lowering therapies, alpha-blockers for hypertension, anti-platelets, memantine, neuroleptics, proton pump inhibitors, H-2 receptor antagonists, anti-spasmodics, theophylline, leukotriene antagonists, calcium supplements, bone<ins cite="mailto:uccadmin" datetime="2016-05-10T21:54"> </ins>anti-resorptive therapy, selective oestrogen receptor modulators, non-steroidal anti-inflammatories, corticosteroids, 5-alpha reductase inhibitors<ins cite="mailto:uccadmin" datetime="2016-05-10T21:56">,</ins> alpha-1 selective blockers, muscarinic antagonists, oral diabetic agents, ACE-inhibitors, angiotensin receptor blockers, systemic oestrogens, multivitamins, nutritional supplements and prophylactic antibiotics. Anticoagulants and anti-depressants were excluded. Despite incorporation of panellists' suggestions acetyl-cholinesterase inhibitors remained inconclusive.

Conclusion

STOPPFrail comprises 27 criteria, which have been judged by broad consensus, to be potentially inappropriate in frailer older patients with limited life expectancy. STOPPFrail may assist in deprescribing medications in these patients.

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Regulation of anxiety behaviour by the ventral but not intermediate or dorsal areas of the hippocampus

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The hippocampus is a key brain structure involved in cognition and stress control. The mechanisms underlying the regulation of these diverse functions by the hippocampus are not yet fully understood. However, several studies suggest that the hippocampus is functionally segregated along its longitudinal axis, whereby the dorsal hippocampus (dHi) plays a preferential role in spatial learning and memory while the ventral hippocampus (vHi) predominantly regulates anxiety and the stress response. More recently, it has been suggested that the area between these two subregions, the intermediate hippocampus (iHi), might also be functionally independent but this hypothesis has yet to be tested directly. Thus, the aim of the present study was to determine the roles of the dHi, iHi and vHi in behaviours related to anxiety, depression and sociability. The dHi, iHi or vHi of C57BL/6 mice was lesioned with ibotenic acid. Lesions of the vHi (but not dHi or iHi) decreased anxiety in the novelty-induced hypophagia test (NIH), a test that is also sensitive to chronic antidepressant treatment. None of the lesions altered locomotor activity, social preference, sucrose preference (a measure of anhedonia) or immobility in the FST (a measure of depressive-like behaviour). Taken together, the present data reinforces the knowledge that the vHi plays a role in anxiety under baseline conditions and in a test that is sensitive to chronic antidepressant treatment. Thus, current studies are assessing the roles of each of these hippocampal subregions in the behavioural response to chronic antidepressant treatment.

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Assessment of Thiel Embalmed Cadavers for Teaching Oral Anatomy and Local Anesthesia to the Dental Students

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Objective: We aimed to determine whether Thiel-embalmed cadavers would provide a useful anatomy teaching tool for subjects that cannot be approached using formalin-fixed cadavers such as oral cavity examination and maxillary anesthesia.

Methods: The suitability of Thiel–embalmed bodies to perform oral examination was assessed by asking first year dentistry students to identify oral structures on a classmate and on a Thiel embalmed body. The ease of location was compared in both settings and their quality was assessed on the cadavers. The suitability of Thiel-embalmed cadavers to teach maxillary anesthesia was assessed by performing mock injections at 5 adjacent sites daily for five consecutive days and inspection of the gingival surface by experienced anatomists and dentists.

Results: Most oral structures were more difficult to locate on cadavers. The texture and appearance of the features in the cadavers were found to be neither unrealistic nor realistic. The relative inexperience of the participants, the accumulation of fixative in the oral cavity and discoloration were mentioned as potential confounding factors. Visual analysis of images obtained following repeated injections revealed no deterioration of the tissue. Importantly, the injection sites appeared to reduce over time, suggesting that the gingival tissue maintains some elasticity following Thiel fixation.

Conclusion: Our findings suggest that Thiel-embalmed cadavers are a useful tool to provide students more time to localize and study aspects of the oral cavity. Likewise, the recoiling capacity of gingival tissue suggests that Thiel-embalmed cadavers may provide an ideal tool for teaching injection technique of local anesthetics.

Ethical approval for the study was obtained from Social Research Ethics Committee (SREC), UCC.

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Title Development and Assessment of a Cranial Nerve Animation to Enhance Dental Student Learning

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The structure/function of the cranial nerves is a core curriculum topic for dental students. However, due to the perceived complexity of the subject, it is often difficult for students to develop a comprehensive understanding of key concepts using textbooks and models. It is accepted that the acquisition of anatomical knowledge can be facilitated by visualization of structures. In the present study we assessed the role of a new animation depicting the cranial nerves as a learning aid for first-year dental students. An animation detailing the cranial nerves, with particular emphasis on a life scenario, was developed based on Mayer's theory of multimedia learning. Questionnaires were designed to assess the participants' attitude towards the animation and their knowledge of the cranial nerves before and after visualization of the animation. We present evidence that use of this animation enhanced student knowledge of the cranial nerves.

Overall, from a selection of questions targeting cranial nerves, students demonstrated improved knowledge on six topics after viewing the animation. From a qualitative point of view, the students described the animation as an enjoyable and useful supplement to reading material/lectures, and indicated that the animation was a useful tool in understanding the cranial nerves. Overall, these findings indicate that an animation demonstrating the cranial nerves in a simple, everyday functional scenario, is effective at facilitating retention of knowledge. While the present study assessed its usefulness as a stand-alone tool, further assessment will be required to determine its capacity to enhance retention in a neuroanatomy class context.

This study was funded by a teaching grant from the Dental School and Hospital, UCC and ethical approval was granted by Social Research Ethics Committee (SREC), UCC.

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The effects of magnesium-rich Aquamin/AquaminMG supplementation in cognitive aging

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Appropriate diet has been shown to positively influence mental health and cognition, and accumulating evidence now suggests that the hippocampus, a brain region responsible for learning, memory and mood, responds to some nutrients by generating a robust increase in new neurons. This process of neurogenesis plays a crucial role in cognitive function, as well as in antidepressant efficacy. The aim of this study is to investigate the potential of a nutraceutical produced by Marigot Ltd (natural seaweed- and seawater-derived mineral-rich food supplement Aquamin™/AquaminMG) as an effective supplement to promote neurogenesis, decrease neuroinflammation and consequently promote cognition. We have previously shown that Aquamin™ has anti-inflammatory effects on brain cells, and many anti-inflammatory mediators have pro-cognitive effects. Elevated brain magnesium, a mineral which is found in high concentrations in Aquamin™/AquaminMG, also enhances cognition in rats and in a mouse model of Alzheimer's disease and can protect against LPS-induced inflammation in rats. Moreover, Aquamin™ attenuates stress-induced behaviour in pigs suggesting brain-mediated beneficial effects. We hypothesise that the magnesium content, in conjunction with the anti-inflammatory properties of Aquamin™/AquaminMG, may enhance neurogenesis and thus cognition, and that it may abrogate loss of cognitive capacity, which can occur due to age and inflammation. To test the hypothesis, we have implemented a multi-disciplinary research programme to determine the potential cognitive benefits of Aquamin™/AquaminMG in young and aged rats, and in elderly human subjects.

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The Impact of the Financial Crisis on Health Expenditure

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The financial crisis led to cuts to public spending across Europe. Our analysis, which focuses on healthcare in particular, examines the difference in public health expenditure before and after the recession across European countries. Specifically, a comparison of means test is used to compare a pre-recession group (2004–2009) with a post-recession group (2010-2015). Our analysis shows that Ireland's public health expenditure suffered a statistically significant reduction as a result of the austerity measures induced by the financial crisis —decreasing relative to GDP, total government expenditure, and total health expenditure. Indeed, Ireland's health expenditure suffered the most severe cutbacks of any European nation around this time. A secondary analysis employing the same methodology is also carried out on Irish gross voted public expenditure to determine if other major public expenditure categories (education and social protection) suffered to the same extent. Our results show that gross voted health expenditure in Ireland fared worse than both education and social protection expenditure, with the health budget falling by €2 billion since 2009. Our findings also show that Estonia, who suffered the second most severe recession in Europe, actually increased their health expenditure throughout the financial crisis.

Our findings have implications for policymakers focused on the quality of the Irish healthcare system and to put in place safeguards to protect health expenditure in times of financial crisis, to ensure continuity of service and timely access to emergency services.

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Effect of egg ovalbumin-derived peptides on blood pressure and cardiovascular risk: A randomized, placebo-controlled crossover study.

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Data from animal and *in vitro* studies suggest vasodilatory effects of bioactive peptides derived from egg-white. Studies in human volunteers are lacking.

To investigate the effect of consuming egg-ovalbumin derived peptides on blood pressure (BP) and biomarkers of cardiovascular risk in adults with an elevated systolic BP.

We implemented a double-blind placebo controlled randomised intervention study among 75 apparently healthy, non-smoking adults aged 50-70y with an untreated systolic BP (130 – ≤150 mmHg). Participants were randomised to powder sachets containing ovalbumin-derived peptides (3g/d) or a placebo (3g/d maltodextrin) in a crossover trial which contained two 6-week treatment periods separated by a 3-week washout. Subjects mixed their sachets with a fruit juice of choice. Subjects attended five study-visits in a fasting state for the collection of blood samples and measurement of office and central BP in accordance with European Society of Hypertension guidelines. All visits took place at the Human Nutrition Studies Unit, UCC. Carotid-femoral pulse wave velocity (PWV) was measured by Vicorder Tonometric device. Concentrations of fasting blood lipids and glucose were measured.

Data from 65 participants (37 male, 28 female) aged 56.9±5yr with a mean systolic BP (135.1±11.9mmHg) were included. Office and central systolic BP and diastolic BP and PWV did not significantly change over time (P>0.05). No significant differences for mean changes (post-minus-pre differences) in BP, PWV or in concentrations of blood lipids or glucose were observed between the egg-peptide and placebo groups. Supplementation with 3g/d ovalbumin-derived peptides for 6-weeks does not appear to lower BP or improve biomarkers of cardiovascular risk in a sample of adults with an elevated BP.

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Microbiota and cardiorespiratory control: Chronic antibiotic treatment does not alter cardiovascular reflex response to chemostimulation in urethane anesthetised rats

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The significance of a healthy gut microbiome on host physiology is becoming increasingly evident. Studies of early life stress have revealed that the microbiome is vital for physiological homeostasis, including diverse aspects of brain function. We hypothesise that disruption of the microbiota-brain axis will result in cardiorespiratory maladaptation.

Male Sprague Dawley rats (n=18) were assigned to sham (normal water, n=10) or chronic antibiotic treatment (ABX, n=8) groups (cocktail of ampicillin (1g/L), vancomycin (500mg/L), ciprofloxacin (20mg/L), imipenem (250mg/L) and metronidazole (1g/L)) for 4 weeks. Under urethane anaesthesia (1.5g/kg i.p.), cardiorespiratory assessments were performed. Data are reported as mean±SD and were statistically compared by two-tailed unpaired Student *t*-test.

Cardiac right (57.7±6.3 vs 51.1±3.0mg/100g; p=0.011) and left ventricular mass (219.4±14.1 vs 206.7±10.2mg/100g; p=0.04) were reduced in ABX animals and haematocrit concentration was decreased compared with sham controls (51.9±0.9 vs 47.9±0.7%; p=0.004). ABX induced tachypnoea (92±8 vs 107±7bpm; p=0.015), with no change in minute ventilation (p=0.225). Systolic blood pressure was reduced in ABX animals (148±15 vs 119±12mmHg; p<0.001). No significant changes in heart rate (p=0.845), diastolic blood pressure (p=0.835), mean arterial blood pressure (p=0.598) or left ventricular contractility (dP/dT_{MAX}; p=0.755) were found when compared with sham treatment. Cervical vagotomy produced a greater bradypnoea in ABX animals compared with sham controls (-35±5 vs -48±10bpm; p=0.03).

Given that chronic antibiotic treatment has been shown to dramatically alter the gut microbiome this study demonstrates that microbiota composition changes have significant effects on the cardiorespiratory system, with decreases in cardiac mass, systolic blood pressure and haematocrit suggestive of the development of cardiac maladaptation.

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Microneedle-patch vaccines: a study into the opinions of Cork city parents

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Purpose: Dissolvable microneedle patches are designed to stabilise vaccines outside of refrigerated conditions and to permit administration using the skin route. Administration using these micron-sized protrusions does not stimulate nerve receptors. Therefore this immunisation method is perceived as painless. Microneedle-mediated vaccine administration would reduce immunisation programme costs: their thermostability eliminates cold chain transportation requirements. Further, their potential for self-administration could reduce the requirement for trained administration personnel; and their reduction in disposal costs as they leave behind no biohazardous sharp medical waste. Despite these advantages, commercial viability, compliance and prescribing practices will depend on technology acceptability. Therefore the purpose of this qualitative study was to examine the acceptability of this technology in a population of Cork city parents.

Methods: Focus groups (n = 6) comprising 32 parents were convened to determine the acceptability of microneedle-patch vaccines. Discussions were audio-recorded, transcribed verbatim and analysed by thematic analysis.

Results: Identified themes included a reduction in pain and fear for the child, a reduction in stress for the guardian and the potential for self-administration. Participants also recognised the potential for alternate uses of microneedle-patches. Concerns included a lack of familiarity and proven efficacy. The inclusion of a delivery indicator was repeatedly suggested to combat the inability to confirm dose delivery. In addition, the potential for allergy and cross-contamination was highlighted.

Conclusion: This study captured the opinions of the eventual end-users of microneedle technology. This has revealed lack of familiarity as a major barrier to acceptability thus a proactive response to increase awareness of this technology should be adopted.

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The knowledge, attitudes and beliefs of nurses about the modification of oral medicines for older adults: a qualitative interview study

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Background

Oral medicines are frequently modified for older adults, despite efficacy and safety concerns [1]. Nurses are responsible for medicine administration and hence medicine modification, in acute and long-term care. The aim of this study is to gain an understanding of the knowledge, attitudes and beliefs of nurses regarding oral medicine modification for older adults.

Methods

Local ethical approval was obtained. Semi-structured, face-to-face interviews were conducted with nurses providing care to older adults in the greater Cork region between March and September 2016. Care sites were purposively selected to include public, private and voluntary long-term care facilities, with and without specialist dementia units, and acute care sites with specialist stroke and geriatric units. A topic guide was developed based on a literature review and piloted with an experienced geriatric nurse. Nurses provided written informed consent for participation. Interviews were audio-taped and transcribed verbatim. Data were analysed thematically [2].

Results

Interviews have been conducted with 16 nurses (81.3% female, median age 38 years (IQR 31.5-52.0 years), median interview length 15 minutes 26 seconds). Analysis of the findings indicated that nurses feel that modifications are "*a necessary evil*". Emergent themes included: the necessity of modification, the nurse as the patient's advocate, the pharmacist's role in information provision and the nurse's need for support.

Conclusion

Modifications are viewed as unavoidable due to limitations regarding the availability of alternatives. The nurse's knowledge of individual patients means that nurses have a vital role in identifying and communicating patient's needs and acting as the patient's advocate.

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Patients' and Healthcare Professionals' Views on the Modification of Oral Medicines: A Qualitative Systematic Review

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Background:

Oral medicines are frequently modified to overcome swallowing difficulties or to administer a lower dose [1]. However, these modifications may compromise the quality, safety and efficacy of the medicine [2]. The aim of this systematic review was to synthesis the available qualitative evidence on the views of adult patients, their healthcare professionals and carers about oral medicine modification.

Methods:

A systematic search of: PubMed, Medline, EMBASE, CINAHL, PsycINFO, Web of Science, ProQuest Databases, Scopus, TRIP, CENTRAL, CDSR and OpenGrey was undertaken from inception to September 2015. Inclusion criteria were; (i) availability of English full-text, and (ii) used qualitative methodology to investigate the views of adult patients, carers or healthcare professionals about oral medicine modification. Thematic synthesis was used to synthesise the findings [3].

Results:

Of 5455 records screened, seven studies were eligible for inclusion; 3 involving healthcare professionals and 4 involving patients. Four analytical themes emerged: (i) patient-centred individuality and variability; (ii) complexity; (iii) communication and; (iv) knowledge and uncertainty. The variability of individual patient's requirements, poor communication practices and lack of knowledge about medicine modification, when combined with the complex healthcare environment complicate decision making.

Conclusions:

This review has highlighted some of the key factors that influence medicine modification. Findings suggest that to optimise modification practices the needs of individual patients should be routinely and systematically assessed and decision-making should be supported by evidence-based recommendations with multidisciplinary input. These findings should be considered in the development of future interventions.

P:56

Pre-operative three-dimensional mapping of the great saphenous veins of coronary artery bypass patients, using conventional, free-hand ultrasonography – a pilot study

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Objectives

In patients due to undergo coronary artery bypass graft (CABG) surgery, two-dimensional ultrasound mapping of the great saphenous veins has previously been shown to decrease post-operative leg wound complications. In this pilot study, we examine the feasibility of using an unmodified ultrasound transducer to pre-operatively generate three-dimensional (3D) vein reconstructions.

Methods

Adult patients scheduled to undergo CABG surgery at our institution were recruited prospectively. Ultrasound scanning of the lower limb veins was carried out pre-operatively, using a conventional ultrasound transducer. Qualitative surgical notes regarding vein quality were post-operatively recorded. Subsequently, 3D vein reconstructions were generated using non-proprietary software algorithms, and subjectively compared to the post-operative surgical notes.

Results

Ultrasound scans were performed on ten pre-operative patients, generating 37 multi-frame ultrasound files. The mean time taken to perform an ultrasound scan of one half-limb was 27.1 seconds (standard deviation 10.6). Five of the 37 recordings were of unsuitable quality for image processing, and a total of 32 three-dimensional vein reconstructions were subsequently generated. The 3D vein reconstructions were subjectively deemed to be consistent with the corresponding post-operative surgical notes.

Conclusions

This study demonstrates the feasibility of using 3D ultrasound in the pre-operative planning of great saphenous vein harvesting. In the absence of specialised ultrasound transducer hardware, it is technically challenging to generate anatomically accurate vein reconstructions. Further research should address techniques to improve the speed and accuracy of the ultrasound image processing algorithms, and adopt objective metrics for verifying the anatomical accuracy of 3D vein reconstructions

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Using Computer-Supported Collaborative Learning to Foster Medical Device Design Innovation and Development

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Computer-supported collaborative learning (CSCL) can be used to provide learners with opportunities to participate in online teamwork in a manner analogous to work environments relevant to their future careers. While teaching and learning can be enhanced by online delivery, it is necessary to ascertain the discipline-specific usefulness of new technology-based solutions. To this end, a structured questionnaire was distributed to engineering and medical schools within higher education institutions (HEIs) in two European countries, as well as small-and-medium-sized enterprise (SMEs) across the EU medical devices sector.

330 respondents completed the survey, of which 34% had previously completed an online course. When asked to rank the seventeen most important features for inclusion in a successful e-learning platform, the top five factors were as follows: learning content/material, clear learning objectives, flexibility/adaptability, feedback, and student assessment. When asked to rank features based on practicality of inclusion in a CSCL environment, theoretical content and practical demonstration of concepts were ranked highest. In contrast, collaborative group interaction and collaborative project implementation were ranked as the most difficult features to include in a platform.

The following features were ranked (high to low) in order of ease of inclusion in a CSCL-based medical device innovation platform: instruction and discussion of case studies; access regular talks by guest speakers; group-based multidisciplinary design projects and student interaction; formal and informal communication tools in e-learning; introduction of structured design methods; introduction of unstructured design methods. Results are discussed in relation to the development of a collaborative interdisciplinary medical device e-learning platform.

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Faecal microRNA's: Messengers from the Hoist-Microbe Interface

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The gut hosts a diverse population of commensal bacteria known as the gut microbiota. The enteric microbiota seems to be characterised by a balance and composition that is unique to the host. It is important to characterise the mechanisms through which the host can maintain the composition of the gut microbiota. MicroRNAs are implicated in intercellular communication and have been isolated from bodily fluids including stool. Recent findings suggest that miRNAs produced by the host's intestinal epithelial cells participate in shaping the microbiota. To investigate, we determined the effect of bacterial status on the expression of microRNAs expressed by IECs in GF mice and in a rat model of antibiotic-mediated depletion of the gut microbiota. Adult male germ free and conventional mice. Adult SD rats treated with a combination of antibiotics for a total of 13 weeks. RNA was extracted from faecal pellets and the expression of let-7b-3p, miR-141-3p, miR-200a-3p and miR-1224-5p was measured relative to U6. In germ-free animals the expression of let-7b, miR-141 and miR-200a was lower compared to conventional mice. Rats undergoing antibiotic-mediated depletion of the gut showed two different profiles of miRNA expression. After 2 weeks of antibiotic treatment, the expression of let-7b and miR-1224 dropped significantly and stayed low throughout the study. In contrast, the expression of miR-200a and miR-141 was significantly higher than before treatment. Subsequently, at week 4, the expression of these miRNAs decreased. This data demonstrates that miRNA's can be used as an independent non-invasive marker of microbial fluctuations in the intestine.

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Out with the old and in with the new! What influences General Practitioner's initial prescribing of new oral anticoagulants?

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Over the last seven years four new oral anticoagulants (NOACs) for treating Atrial Fibrillation patients for stroke prevention came to market. While warfarin remains the most widely used anticoagulants it requires frequent monitoring owing to bleeding risks. This is expensive and time consuming, particularly for patients. NOACs promise to overcome the limitations of warfarin. However, concerns about their safety and effectiveness related to their pharmacokinetic characteristics make prescribing NOACs and caring for NOAC patients' complex. Thus it is imperative that GPs who are prescribing NOACs are educated and guided so as to maximise the benefits and avoid the pitfalls of NOACs.

Using primary evidence from a dedicated survey this study explores GPs attitudes and experiences with prescribing NOACs in Ireland where, despite warfarin being first line therapy, the number of patients being prescribed NOACs is increasing.

Results reveal 46% of the sample initiated NOAC prescriptions and GP practice size is a significant factor influencing this. Survey analysis revealed no difference regarding the sources of information considered important amongst GPs when prescribing new drugs (over 80% consider hospital consultants, other GPs and conferences as important). There subtle differences regarding the factors considered important when prescribing anticoagulants between initiating and non initiating prescribers. Furthermore, 15% and 5% of all GP respondents respectively did not consider hepatic or renal impairment important.

The results suggest continuing information and education tools for GPs who are prescribing NOACs and managing NOAC patients are imperative, to ensure the right anticoagulant is prescribed for the right patient at the right time.

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The cortisol awakening response is altered in females with irritable bowel syndrome

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Irritable bowel syndrome (IBS) is a female-predominant stress-related gastrointestinal disorder with a high psychiatric comorbidity. Previous evidence (e.g. Kennedy et al., 2014) has indicated that IBS is associated with an altered cortisol awakening response. However, heterogeneity in IBS study populations may contribute to differing findings reported across research studies. It is thus currently unclear whether altered HPA axis activity is a feature of IBS *per se* or related to comorbid depression and anxiety. The current research aims to assess the nature of the cortisol awakening response in a cohort of females with IBS without comorbid depression or anxiety (N = 9) and healthy controls (N = 15). Saliva samples were collected at four timepoints (waking, 30 minutes, 45 minutes and 60 minutes after waking) on two mornings (approximately one week apart).Salivary cortisol levels were analysed using enzyme-linked immunosorbent assays. There was evidence of an altered cortisol awaking response in IBS, and this was most apparent in week 2 where IBS patients were more likely to display peak cortisol levels at 45 rather than 30 minutes. (IBS patients were more likely than controls to peak at 45 minutes post-waking ($p = .046$), with controls more likely to peak at 30 minutes post-waking ($p = .058$), at week 2. Such an effect was not observed during the first week) The current results offer further evidence of altered HPA axis activity in irritable bowel syndrome, although further research is required into the stability of these changes over time.

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Exercise, travel and the gut microbiota

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The human gastrointestinal tract is home to between 10^5-10^{11} bacteria per gram; with the large intestine being the most densely populated. These bacteria have been shown to confer benefits for the host, such as contributing to the obtaining of nutrients from and metabolism of food, protection against pathogens, assisting in the maturation of the immune system and even influencing social behaviours. However, the relationship between the host and the bacteria inhabiting the gastrointestinal tract is incredibly complex and is influenced by other factors including diet, age, environmental factors, host genetics and, more recently, exercise.

Travel is another factor which has the potential to alter the gut microbiota through alterations in diet while travelling, time zone changes and other stress factors. To date the impact of travel on the gut microbiome remains unknown.

This study focuses on the microbiota of a group of elite athletes competing in international tournaments. Initial biodiversity analysis from a pilot study indicates that an individual's microbiota continues to cluster with other samples from the same individual after travel. However, travel and associated dietary changes does seem to have an impact on bacterial diversity and composition.

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TLX as a protective modulator against IL-1β-induced impairment in hippocampal neurosphere growth

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Hippocampal neurogenesis is the process by which new neurons are produced from neural stem cells (NSCs) and is involved in some forms of memory and emotion regulation. Sustained proliferation of NSCs within the hippocampus is a key factor in maintaining normal hippocampal neurogenesis. The pro-inflammatory cytokine IL-1β is an important mediator of neuroinflammation and is elevated in conditions associated with hippocampal dysfunction such as Alzheimer's disease and major depression. Evidence now demonstrates that IL-1β suppresses the proliferation of NSCs. TLX is an orphan nuclear receptor known to regulate the NSCs proliferation and it has been shown that IL-1β reduces TLX expression in NSCs. We investigated whether a restoration of TLX expression in hippocampal NSCs can prevent the anti-proliferative effects of IL-1β. Embryonic day 18 rat hippocampal neurospheres were transfected with a lentiviral vector (LV) overexpressing either TLX (OEX) or Green Fluorescent Protein (GFP). The formation and growth of the neurospheres were measured in the presence or absence of IL-1β for 5 days *in vitro*.While IL-1β did not impair neurosphere formation it significantly impaired neurosphere growth after 3DIV. Early results indicate that TLX overexpression increased neurosphere growth compared to control treatment. Moreover, overexpression of TLX also attenuated the IL-1β-induced reduction in neurosphere growth. This effect appears to be TLX specific as this<ins cite="mailto:Ciaran%20O%20Leime" datetime="2016-05-04T16:22"> </ins>attenuation is not observed in the LV-GFP-treated neurospheres in response to IL-1β. Analysis is currently being carried out to assess the effects of IL-β and TLX(OEX) on the cellular phenotypes in neurospheres and on their proliferative capacity

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The effect of pharmacist-led interventions in optimising prescribing in older adults in primary care: a systematic review.

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Objective:
To evaluate studies of pharmacist-led interventions on potentially inappropriate prescribing among community-dwelling older adults receiving primary care to identify the components of a successful intervention.

Data Sources:
An electronic search of the literature was conducted using the following databases from inception to December 2015: PubMed, EMBASE, CINAHL, MEDLINE (through OVID), TRIP, Centre for Reviews and Dissemination databases, Cochrane Database of Systematic Reviews, ISI Web of Science, Science Direct, ClinialTrials.gov, metaRegister of Controlled Trials (mRCT), ProQuest Dissertation and Theses Database, (Theses in Great Britain, Ireland and North America).

Review Methods:
Studies were included if they were randomised controlled trials (RCTs) or quasi-randomised studies involving a pharmacist-led intervention compared to usual/routine care which aimed to reduce potentially inappropriate prescribing (PIP) in older adults in primary care. Methodological quality of the included studies was independently assessed.

Results:
A comprehensive literature search was conducted which identified 2,193 studies following removal of duplicates. Five studies met the inclusion criteria. Four studies involved a pharmacist conducting a medication review and providing feedback to patients or their family physician. One RCT evaluated the effect of a computerised tool that alerted pharmacists when elderly patients were newly prescribed potentially inappropriate medications. Four studies were associated with an improvement in prescribing appropriateness.

Conclusion:
Overall, this review demonstrates that pharmacist-led interventions may improve prescribing appropriateness in community-dwelling older adults. However the quality of evidence is low. The role of a pharmacist working as part of a multidisciplinary primary care team requires further investigation to optimise prescribing in this group of patients.

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A single exercise session produces immediate benefits for children's working memory and multisensory perception

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Objective: A wealth of research documents the positive effects of exercise for children's cognition. However, recent reviews recommend isolating benefits to specific cognitive functions and exploring exercise type as a potential mediator. In line with the Cognitive Engagement hypothesis, exercise which occurs in an unpredictable environment (open skill exercise; e.g. team sports) should provide greater cognitive benefits than more repetitive and predictable exercise (closed skill exercise; e.g. swimming laps) due to higher cognitive demands. The present study investigated benefits of one session of open skill, closed skill and an exergame (GoNoodle™) exercise for working memory and perception in primary school children.

Method: Participants were assigned to one of three exercise groups (open skill, closed skill, GoNoodle™) or a control group. Participants (n = 61) completed cognitive tasks (Digits Backward, Corsi Block, Motor Span, sound-induced flash illusion) immediately before and after a 30 minute exercise session.

Results: Open and closed skill exercise produced similar cognitive benefits, with improvements for motor working memory and perception. Improved motor working memory was also found after a session of GoNoodle™. No effect of exercise was found for verbal or visuospatial working memory. No improvements were found for the control group.

Discussion: The finding that a single exercise session, regardless of exercise type, improves aspects of children's cognition has considerable applied implications. Exercise may prove a viable intervention for enhancing working memory and perception in school-going children, a prospect with added value in the context of developmental disorders, where these cognitive processes are typically impaired.

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HbA1c utility to detect undiagnosed diabetes in acute medical hospital admissions

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RESEARCH DESIGN AND METHODS:

From 2005 to 2007, 2061 white Caucasians, aged >18 years, were admitted by 1/7 physicians. Those with diabetes symptoms/complications but no previous record of hyperglycaemia (n=390), underwent OGTT with concurrent HbA1c in representative subgroup (n=148). Comparable data were obtained for 108 primary care patients at risk of diabetes.

RESULTS:

Diabetes was diagnosed immediately by routine practice in 1% (22/2061) [aged 36 (26-61) years (median IQ range)/55% (12/22) male] with pre-existing diabetes/dysglycaemia present in 19% (390/2061) [69 (58-80) years/60% (235/390) male]. Possible diabetes symptoms/complications were identified in 19% [70 (59-79) years/57% (223/390) male] with their HbA1c similar to primary care patients [54 (46-61) years], 5.7 (5.3-6.0)%/39 (34-42)mmol/mol (n=148) vs 5.7 (5.4-6.1)%/39 (36-43)mmol/mol, p=0.35, but lower than those diagnosed on admission, 10.2 (7.4-13.3)%/88 (57-122)mmol/mol, p<0.001. Their fasting plasma glucose (FPG) was similar to primary care patients, 5.2 (4.8-5.7) vs 5.2 (4.8-5.9) mmol/L, p=0.65, but 2hPG higher, 9.0 (7.3-11.4) vs 5.5 (4.4-7.5), p<0.001. HbA1c identified diabetes in 10% (15/148) with 14 confirmed on OGTT but overall 32% (48/148) were in diabetic range on OGTT. The specificity of HbA1c in 2061 admissions was similar to primary care, 99% vs 96%, p=0.20, but sensitivity lower, 38% vs 93%, p<0.001 (63% on FPG/23% on 2hPG, p=0.037, in those with possible symptoms/complications).

CONCLUSION:

HbA1c can play a diagnostic role in acute medicine as it diagnosed another 2% of admissions with diabetes but the discrepancy in sensitivity shows that it does not reflect transient/acute hyperglycaemia resulting from the acute medical event.

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Ghrelin sensitises colonic myenteric neurons to the neurostimulatory effects of glucagon-like peptide 1.

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Ghrelin is an orexigenic that is at peak levels prior to ingestion of food post meal ingestion concentrations return to normal. Subsequently the incretin hormone glucagon-like peptide-1 (GLP-1) is secreted by L-cells in response to nutrients in the GT tract. GLP-1 is thought to act via its receptor to inhibit gastric acid secretion and motility. Ghrelin directly stimulates L-cell to secrete GLP-1 and has been shown to prime L-cells for nutrient-induced GLP-1 release. The aims of the study are to investigate the effects of ghrelin on GLP-1-mediated neuronal regulation of gut motility.

Cross-sections of Sprague-Dawley distal colon and longitudinal muscle myenteric plexus tissue preparations were fixed, permeabilised and blocked prior to immunofluorescent labelling of ghrelin GLP-1 receptors. Colonic motility was assessed in organbaths.

Both ghrelin and GLP-1 receptors were detected in the smooth muscle and myenteric nerve plexus of the distal colon with significant co-localisation. Ghrelin increased circular muscle contractility ($p<0.001$) as measured by an increase in area under the curve. GLP-1 had a smaller effect and co-application of ghrelin and GLP-1 further enhanced the colonic contractions ($p< 0.01$). Interestingly, ghrelin enhanced the amplitude of the carbachol-evoked contraction in circular ($p<0.05$) but not longitudinal muscle.

GLP-1 and ghrelin receptors are highly co-localised in myenteric neurons suggesting a role in the neuronal regulation of smooth muscle contractile function in the distal colon. Indeed, ghrelin increased contractile activity in both circular and longitudinal muscle. GLP-1 similarly increased contractile activity but pre-exposure to ghrelin appears to further potentiate the GLP-1-evoked effects on colonic contractility.

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Respiratory control and the microbiota: Altered ventilatory responsiveness to hypoxic and hypercapnic gas challenges in adult male rats following chronic antibiotic treatment

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We previously demonstrated in rats that early life stress results in disordered breathing and impaired ventilatory responsiveness, effects that correlate with alterations in gut microbiota. We sought to explore the putative link between altered microbiota and respiratory control using chronic antibiotic treatment (ABX) to disrupt the adult microbiome.

Adult male Sprague Dawley rats were treated with an antibiotic cocktail (n=20) or autoclaved deionised water (n=20). Cages were cleaned every second day. Animals were studied after 4 weeks; following a washout period of 72 hours, animals in both groups received transplantation by oral gavage of control faeces and transfer to control bedding for a period of 4 weeks. Ventilation and metabolism during air breathing and in response to hypoxic (10% O2) and hypercapnic (5% CO2) gas challenges were assessed by whole-body plethysmography. Data are reported as mean ± SD and were compared by unpaired t-test.

Baseline ventilation was unaffected by ABX (0.49±0.07ml/min/g) compared with control (0.50±0.06ml/min/g); resting metabolism (VCO2 production) was not different between the two groups (0.018±0.002 versus 0.016±0.003ml/min/g). Ventilatory responsiveness to hypercapnia was blunted in ABX animals. Thus, VE/VCO2 was lower (p=0.042) during 5% CO2. ABX had modest effects on the hypoxic ventilatory response. Baseline ventilation and ventilation during hypoxia and hypercapnia were not different when comparing re-colonized animals.

Here we show that ABX blunts ventilatory responsiveness to hypercapnic chemostimulation, suggestive of altered reflex control of breathing. Blunted ventilatory responses to classical activation of chemoreceptors suggests aberrant plasticity in sensory pathways key to respiratory homeostasis.

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Health Social Networks and Informed Consent: What happens to your Patient-Generated Health Data?

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Online health data-sharing social media platforms (also known as Health Social Networking Sites (HSNs)) play a critical role in the modern healthcare ecosystem. Patients, in particular, can access these virtual communities where they can share detailed health data, such as symptoms and treatments, in order to learn from others, improve their health outcomes and contribute to society. The nature of HSNs permits users (i.e. patients) to connect, collaborate, and discuss health-related issues with comparative ease. As a result, a vast amount of patient-generated health data is being created thus, leading to potential exploitation of this 'big health data scenario' for medical research. While mining patient-generated health data, vis-à-vis HSNs, could provide significant insights into societal health outcomes, it does raise serious ethical questions around the use of this data. HSNs are often designed in a way which may result in patients unintentionally providing consent without fully understanding how and why their data will be utilised for research purposes and the subsequent advantages, disadvantages and achievable outcomes associated with the use of this data. Given the current approach to informing users, the question remains: Do users of HSNs actually know what is happening to their data when they use health social media sites? Using a socio-technical lens, the CHASM (Consenting Health dAta through Social Media) project, funded by The Wellcome Trust, aims to examine this question and explore other potential avenues for informing the user about the nature in which their data is used on HSNs.

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The Effects of Mindfulness-Based Interventions for Health and Social Care Undergraduate Students – A Systematic Review of the Literature

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Health and social care undergraduate students experience stress due to high workloads and pressure to perform, impacting upon the future delivery of patient care. Wellness is increasingly viewed as an essential professional competency. Mindfulness may be a suitable way to incorporate wellness training into health and social care degree courses.

The objective of this systematic review is to identify and critically appraise the literature on the effects of Mindfulness-Based Interventions for health and social care undergraduate students.

PubMed, EMBASE, Psych Info, CINAHL, The Cochrane Library and Academic Search Complete were searched from inception to 31st March 2016. Key journals and reference lists were also examined. Studies that delivered Mindfulness Based Stress Reduction, Mindfulness Based Cognitive Therapy, or an intervention modelled closely on these, to health or social care undergraduate students were included. The search strategy yielded eleven papers, and a narrative synthesis was conducted.

Eleven studies, representing students from medicine, nursing and psychology met the inclusion criteria. The most commonly used measurement tools were; the Five Facet Mindfulness Questionnaire, the General Health Questionnaire and the measure of Subjective Wellbeing. Primary outcomes were benefits relating to stress, mood, anxiety, and mindfulness levels. Gender and personality emerged as factors likely to affect intervention results.

Mindfulness-Based Interventions may produce benefits for health and social care undergraduate students in areas including stress, mood, and anxiety. Further research is required to definitively conclude that mindfulness is an appropriate intervention to mentally prepare health and social care undergraduate students for their future careers.

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Examining Stress – An Investigation of the interaction between Stress, Mood and Exercise in Students

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Background: Stress is an event that threatens homeostasis and as a result causes physiological and behavioural responses in an attempt to reinstate equilibrium. Excessive and/or chronic stress can be psychologically and physiologically detrimental. Examinations can represent a significant source of stress for students. The Hypothalamic Pituitary Adrenal axis (HPA) is the core endocrine stress system. Investigations into the HPA response to written examinations have yielded inconsistent results. The aim of this study is to explore the relationship between examination stress, HPA axis activity, mood, sleep and exercise in students undergoing a naturalistic written examination.

Methods: 16 students sitting the same written examination were recruited. Students completed multiple questionnaires on stress, anxiety, depression, sleep, physical activity and caffeine consumption and provided saliva samples during an examination-free period and an examination period one month later. The cortisol awakening response (CAR), representative of HPA activity, was determined by enzyme-linked immunosorbent assay.

Results: Anxiety ($p=0.04$) and depression scores ($p=0.05$) increased during the examination period. There was a simultaneous decrease in physical activity levels ($p=0.02$). There was a non-significant increase in HPA activity ($p=0.34$) during this period. There was a non-significant decrease in sleep quality ($p = 0.55$) and increase in caffeine consumption ($p = 0.92$) during the examination period.

Conclusions: Examinations significantly increase anxiety and depression scores, and decrease physical activity. Furthermore, they do not significantly alter HPA axis activity, sleep quality or caffeine consumption. Future studies must investigate the relationship between these measures and examination performance to help to identify potential protective interventions.

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Impact of voluntary exercise during adolescence on cognitive performance in a touchscreen operant chamber during adulthood

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Adolescence is a critical period for postnatal brain maturation and thus increased susceptibility to emotional and cognitive-related disorders. Exercise during adulthood has been shown to increase neural plasticity and enhance cognition. However the impact of exercise during adolescence on the brain and behaviour in adulthood remains to be fully elucidated. The aim of this study was to determine the impact of voluntary exercise during adolescence on neural plasticity and cognition in adulthood. Adolescent male Sprague-Dawley rats (4 weeks) were divided into a sedentary control group or exercise group. Adolescent rats where initially trained to use a touchscreen operant chamber. During adulthood (8 weeks) rats were trained to discriminate between the locations of two adjacent identical stimuli. Inter-stimulus distanced was varied with a small inter-stimulus distanced probe (small separation) and large inter-stimulus distanced probe (large separation). Upon acquisition the reward location was switch and animals required to reacquire the task. The results indicate exercise enhanced reversal learning within the location discrimination task during the small separation and large separation. Exercise readily enhanced reversal learning when the task was challenging (i.e. small inter-stimulus separation). Interestingly, acquisition of the location discrimination task was affected by inter-stimulus distance but not exercise. In addition, exercise also increased the expression of BDNF, Creb, TLX, PSD-95 and Synaptophysin mRNA within the hippocampus. These findings suggest exercise readily improved reversal learning, a prefrontal cortex dependent process, particularly when the task was challenging as well as upregulating the expression of several genes involved in neural plasticity within the hippocampus.

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Acute hypoxic stress causes diaphragm muscle weakness in mice

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The effects of acute hypoxia (AH) on the diaphragm are largely unknown despite the potential clinical relevance.

Adult male C57BL6/J mice (n=8 per group) were exposed to 8hr of AH (F_iO_2 = 0.10) or normoxia. A separate group of mice (n=8) were administered N-acetyl cysteine (NAC; 200mg/kg, I.P.) immediately prior to AH. Ventilation was assessed using whole-body plethysmography. Oxygen consumption and carbon dioxide production were measured. Diaphragm muscle contractile performance was determined *ex-vivo*. Gene expression was examined at 1, 4, and 8hrs using qRT-PCR. Citrate synthase activity was measured. Data are mean±SD and were compared by ANOVA or Student *t* test; p values are reported.

Minute ventilation during AH was initially increased ($p<0.001$, ANOVA at 10mins), but quickly returned to normoxic levels for the duration of gas exposure. VCO_2 production was reduced throughout AH exposure ($p<0.0001$). AH decreased diaphragm peak force (30±3 vs. 21±2 N/cm^2, $p=0.0334$) and force-frequency relationship ($p=0.0112$), but increased endurance ($p<0.0001$). AH increased PGC1a ($p<0.05$), UCP-3 ($p<0.01$), Foxo-3 ($p<0.05$) and MuRF-1 ($p<0.05$) gene expression. Citrate synthase activity was increased ($p<0.05$) following AH. NAC pre-treatment prevented the AH-induced diaphragm weakness.

AH is sufficient to cause diaphragm muscle weakness in the mouse, which may relate to atrophy. Muscle weakness likely relates to direct hypoxic stress. Muscle weakness was prevented by antioxidant supplementation. These findings highlight a potentially critical role for hypoxia in diaphragm muscle dysfunction observed in acute respiratory patients.

P:73

Development of an Intensive Anatomy and Simulation Based training course for Junior Plastic Surgery Trainees

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Background

The advent of streamlined run-through surgical training has shortened the traditional training pathway. As a result, surgical trainees are required to deal with specialist clinical practice at an earlier stage of their careers, necessitating greater knowledge of experience of specialty topics. Furthermore, trainees will encounter more challenging “on-call” clinical situations at earlier stages of their careers. This is of particular importance for specialties such as Plastic Surgery, to which trainees may have had minimal exposure prior to entry into Specialist Training.

Methods

Review of Intercollegiate Surgical Curriculum Project curriculum for Plastic Surgery. Consultation with surgical trainees, specialty trainees and specialty trainers, identifying areas most frequently encountered on commencement of specialty training, and common pitfalls and areas of knowledge deficit. Development of Anatomical and Simulation based intensive training course to address these areas

Results

1 Day, structured Training course incorporating didactic teaching, cadaveric anatomical revision, simulated surgery and clinical scenarios. Pre-course revision material module to compliment course material and address knowledge deficits.

Conclusions

Earlier introduction of surgical trainees to specialties such as plastic surgery necessitates focussed clinical education in order to ensure trainees are adequately prepared for earlier adoption of clinical roles and responsibilities. Well structured, interactive training incorporating simulation and clinical scenarios will mitigate the impact of streamlined surgical training pathways and ensure trainees are equipped to manage more complex, specialised clinical challenges.

P:74

Hospital presented self-harm surveillance data: Benefits and clinical implications

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Background: Surveillance of hospital-presented self-harm is an essential component of self-harm and suicide prevention. Surveillance system data allows for the study of specific subgroups of self-harm patients such as those who engage in high frequency repetition over time. This allows for the analysis of short- and long-term risk factors for repetition which can directly inform clinical practice.

Method: Ongoing self-harm surveillance is part of the large HRB funded research programme called *Improving Prediction and Risk Assessment of Self-harm and Suicide* (IMPRESS). Information obtained by the IMPRESS study will improve the knowledge base on predictive risk and protective factors associated with repeated self-harm and suicide. The study includes a subgroup of self-harm patients known as major repeaters who have a history of 5 or more self-harm episodes. Data from the National Self-Harm Registry Ireland will be used to examine predictive factors associated with risk of repeated self-harm among major repeaters.

Results: Survival analyses will reveal information on factors associated with repetition in the 7 days and 1, 3, 6 and 12 months after an index act for all cases involving major repeaters between 2007 and 2015. This moving window will provide information on what profile of patients is most at risk in the short, medium and long term.

Discussion: The findings of this study will, in conjunction with related studies in the research programme, provide the basis for the development of a *Self-Harm Assessment and Management Programme for General Hospitals* (SAMAGH) that will be implemented across all emergency departments in Ireland.

P:75

MiRNA Exploratory Panel in Hypoxic Ischemic Encephalopathy

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Objective

Our group has previously shown that downregulation of cord miR-374a occurs in neonatal hypoxic ischemic encephalopathy (HIE). We wanted to explore further potential miRNAs from our microarray and current literature, to help create a robust diagnostic biomarker panel for HIE.

Methods

Term infants were recruited at birth and followed through the neonatal period. They were assessed as three groups: perinatal asphyxia without HIE(PA), HIE and healthy controls. Grade of HIE was assigned at 24 hours based on modified Sarnat grade and EEG. 11 miRNA of interest were quantified using qRT-PCR analysis and compared between the three patient groups.

Results

51 infants were included in this analysis: 15 control, 17 PA and 19 HIE (9 Mild, 5 Moderate and 5 Severe). A downregulation of miR-376c, miR-410, and miR-199a was seen between the HIE group when compared to the control group, with p=0.025,p=0.038, and p=0.037 respectively.

Conclusion

We have found 4 potential miRNAs in UCB, that may help generate a diagnostic panel for HIE at birth. This is vital as early therapeutic intervention decreases the risk of adverse outcome in HIE.

P:76

An assessment of the HPAT- Ireland score as a measure of medical student empathy, a pilot study.

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Introduction:

Empathy is regarded as an important competency required by health professionals. Research in medical education has primarily employed the Jefferson Scale of Physician Empathy (JSPE) instrument to demonstrate a relationship between empathy levels and clinical competence. Since 2009, the Irish medical school application process ranks applicants based on secondary level grades and performance in the Health Professions Admission Test-Ireland (HPAT-Ireland). HPAT-Ireland was introduced to broaden access to medical school and increase emphasis on non-academic attributes.

Aim:

To determine whether performance in any of the HPAT sections, most specifically the interpersonal understanding section, correlates with self-reported empathy levels in medical students.

Methods:

A cross sectional design was employed. The sample consisted of a cohort of students across years 1-5 of the undergraduate medical programme. Questionnaires were distributed. Empathy was evaluated using the student-JSPE.

Results:

A total of 290 students participated. Males scored significantly higher than females on HPAT-Ireland Section 1 (*logical reasoning and problem-solving*) and Section 3 (*non-verbal reasoning*). In contrast, females scored significantly higher than males on HPAT-Ireland Section 2 (*interpersonal understanding*). Females demonstrated significantly higher total JSPE scores relative to males. No significant association was observed between JSPE scores and any of the HPAT-Ireland measures. There was no effect of programme year on JSPE scores.

Conclusion:

The introduction of the HPAT–Ireland test was partly designed to identify students with strong interpersonal skill. However, a significant finding of this study is that JSPE values did not correlate with HPAT-Ireland scores. HPAT-Ireland requires further evaluation of its effectiveness in identifying students with stronger interpersonal skills.

P:77

Synonymous co-variation across the E1/E2 gene junction of Hepatitis C virus defines virion fitness

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Hepatitis C virus is a positive-sense single-stranded RNA virus. The gene junction partitioning the viral glycoproteins E1 and E2 displays concurrent sequence evolution with the 3'-end of E1 highly conserved and the 5'-end of E2 highly heterogeneous. We have previously used ultradeep pyrosequencing to generate an amplicon library spanning the E1/E2 gene junction from a treatment naïve patient where samples were collected over 10 years of chronic HCV infection. During this timeframe maintenance of an in-frame insertion, recombination and humoral immune targeting of discrete virus sub-populations was identified. Overtime, the number of codons actively mutating decreased for all virus groupings. In the current study, we present evidence of epistatic evolution across the E1/E2 gene junction and observe the development of co-varying networks of codons set against a background of a complex virome with periodic shifts in population dominance. Division of the virome into sub-populations of related virions identified strong synonymous co-variation between codon sites in a group of sequences harbouring a 3 bp in-frame insertion. Furthermore, measures of codon pair bias and CpG/UpA dinucleotide frequencies were taken and analysed to determine whether these parameters could be linked to the expansion or decline of each of the virus sub-populations.

P:78

Drunk Bugs: Chronic Vapour Alcohol Exposure Induces Marked Changes in the Gut Microbiome in Mice

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To date, few studies have investigated gut microbiota in substance abuse including alcohol. Route of administration is an important factor in how a substance of abuse could potentially affect the gut microbiome. To this end, adult male C57BL/6J mice were exposed to 4 weeks of chronic intermittent vapourized ethanol (CIE, N=10) or air (Control, N=9). Faecal samples were collected at the end of exposure followed by 16S sequencing and bioinformatic analysis. Robust separation between CIE and Control was seen in the microbiome, as assessed by alpha (Shannon and Simpson index, $p<0.05$) and beta (ANOSIM, $p<0.001$) diversity, with a notable decrease in alpha diversity in CIE. Kruskal-Wallis test revealed significant increases in *Alistipes* ($p<0.001$), while all other significant taxa decreased in the CIE group. These results demonstrate that CIE exposure markedly alters the gut microbiota in mice. These findings align with previous research showing similar microbiota alterations in inflammatory states during alcoholic hepatitis and psychological stress.

P:79

Understanding the role of Diabetes Nurse Specialists in Ireland: A cross-sectional national survey

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Background

Integrated management across community and specialist services can improve quality of care for people with Type 2 diabetes mellitus (T2DM). In Ireland the community-based Diabetes Nurse Specialists (DNS) service has been expanded to facilitate the delivery of a new model of integrated care, where uncomplicated T2DM is managed in primary care, and complicated T2DM is managed between primary and secondary care. Our aim is to understand the role of existing and newly introduced DNSs, and examine regional variation in the service.

Method

Online questionnaires were administered by email to 152 DNSs, and addressed the nurse's clinical role, links with primary and secondary care, and referral access to support services. Fisher's exact test was used to test differences across 4 regions of the Health Service Executive. A p-value of <0.05 (Bonferroni adjusted for multiple testing) was considered statistically significant.

Findings

In total, 101 (66.4%) DNSs responded. Most hospital and community DNSs reported that patients with complicated T2DM attended their service. There were regional differences in access to specialist resources, including psychologists and ophthalmologists. Almost all DNSs (91.1%) had a liaison role with other healthcare professionals, but only 36.6% reported a formal agreement between primary and secondary care on how their service operates.

Discussion

Most DNSs were seeing patients with complicated T2DM, as recommended under the national model. However, the lack of agreement on DNS services across settings, and regional issues with resourcing and referral access, should be areas for attention as new policy changes increase demand for DNS services.

P:80

A comparison of Toll like receptor mediated innate immune response in children with cystic fibrosis and an age matched control cohort

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Toll like receptor (TLR) response has been suggested as a factor in the inter-individual variability in clinical phenotype in patients with CF (1). We have previously demonstrated an endotoxin-tolerant state in clinically stable adult patients with CF (2). This study aims to compare whole blood TLR response in children with CF to a cohort of healthy control children.

Bloodfrom 36 children with CF (mean FEV_1 96.79%) and 49 control children was incubated for 6 hours with 6 different Pathogen associated molecular patterns(Pseudomonas hexa (TLR4), Pseudomonas pentya-acyl (TLR4), Burkholderia cenocepacia (TLR4), Flagellin (TLR5), Pam3CYS (TLR1/2) and 0111:B4 (TLR4)) using an ex-vivo whole blood stimulation model. Pro and anti-inflammatory cytokines (IL-1β, IL-6, IL-8, IL-10 and TNF-α) were measured in the supernatant. Data was monocyte corrected and Log_{10} transformed. Data was analysed using SPSS Version 22.0.

There was no significant difference in basal circulating cytokines in children with CF compared to the control cohort (*p>0.05*). There was no significant difference between stimulated pro-inflammatory cytokine response in children with CF and the control cohort for any TLR (*p>0.05*).There was no significant difference in response for the group of children on ivacaftor (n = 5) compared to the children not on ivacaftor (n = 31). Sputum Pseudomonas status – as defined by Leeds Criteria - did not affect TLR response (*p> 0.05*).

In contrast to an adult cohort, children with CF with less severe disease do not demonstrate attenuated cytokine responses compared to healthy control cohorts. This may develop with disease progression.

P:81

The Metabolic Consequences of CFTR Modulation with Ivacaftor in a Single Adult Cystic Fibrosis Centre Cohort

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Ivacaftor produces significant benefit in patients with cystic fibrosis (CF) with the G551D mutation. Recent data have supported improved insulin secretion profile and reversal of CF related diabetes (CFRD) in patients treated with Ivacaftor. Significant weight gain has been demonstrated with Ivacaftor, thus raising the potential for development of dyslipidaemia in a cohort traditionally treated with a high fat diet.

24 Adult patients with the G551D mutation had Oral Glucose Tolerance Test (OGTT), Fasting lipid profile and HbA1C measured before and after commencing Ivacaftor therapy. 6 patients had pre-existing CFRD and Insulin requirements were analysed in this cohort before and after Ivacaftor. Data was analysed using Wilcoxon signed-rank test.

No significant change was observed in fasting glucose, 2 hour post prandial glucose, or HbA1C after commencement of Ivacaftor. Significant median increase in total fasting cholesterol (0.2 mmol/L, P = 0.025) and HDL (0.16 mmol/L, P = 0.03) were observed after commencement of treatment. There was no significant change in LDL or Triglycerides. In the 6 patients with CFRD no significant change in either total insulin requirements or units of insulin per kilogram of weight were observed.

In a large single centre cohort with the G551D mutation we report no significant change in OGTT, HbA1c or insulin requirements after Ivacaftor. While a significant increase in Fasting cholesterol was observed, median values were within normal limits. Changes in lipid profile may reflect the impact of adhering to a high fat diet as a consequence of therapy and will required long-term follow up.

P:82

TRANSLATING A HEALTH COACH INTENSIVE BEHAVIOURAL CHANGE INTERVENTION INTO AN MHEALTH FACILITATED INTERVENTION: A WORK IN PROGRESS

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Background: Obesity is a global, population level problem; it is a chronic but preventable disease which must be treated at scale (WHO, 2000). In treating obesity and comorbid diseases (e.g. cardiovascular disease and Type 2 Diabetes), modest weight loss (e.g. 3-5% body weight reduction) can impact health outcomes (Foley et al., 2016). Web-based interventions are effective in improving specific knowledge and behaviour change relating to weight loss (Wantland et al., 2004). Methods:The RediCare intervention is a 12-week evidence-based, educational programme that treats obesity through lifestyle change. Health coaches facilitate the intervention, which seeks to increase physical activity to 10,000 steps a day, restrict calories and improve diet quality in obese (BMI>30) participants. Outcome variables relating to obesity and comorbid chronic disease are monitored, including body weight, blood pressure, cholesterol and Haemoglobin A1c. Participants' adherence to the programme is monitored remotely through the use of a wireless weighing scale, food tracking mobile application (MyFitnessPal) and a physical activity tracking device (Fitbit).
This research aims to translate the health coach delivered intervention into a web-based format. Educational modules are being broken down into key themes by the researcher to make up brief audiovisual clips. These will be sent out to participants according to information collected from mHealth tools regarding their adherence/progress.
Results and Conclusions: Results of the mHealth intervention will be compared to the original intervention (mean body weight reduction=10.1%). Results will have implications for the scalability of lifestyle change interventions for the treatment of obese individuals.

P:83

Developing an Interactive Intervention to Raise College Men's Awareness of Testicular Diseases and Symptoms: The E-MAT Study

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Background:

Testicular cancer is the most common solid tumour among young men in Ireland. Non-malignant disorders such as testicular torsion and epididymitis, are also common and can be life-threatening if left untreated.

Findings from three reviews on men's awareness of malignant and benign testicular disorders suggest that men lack awareness of testicular disorders, and intend to delay help-seeking for symptoms such as lumpiness, swelling, and pain.

Aim:

To describe and discuss the development of an interactive intervention aimed at raising men's awareness of testicular disorders and symptoms.

Methods:

The Medical Research Council Framework guided the development of this intervention. The evidence base was identified by conducting two systematic reviews on testicular cancer awareness, and one integrative review on awareness of benign testicular disorders. A qualitative descriptive study (n=29) was then conducted to explore men's awareness of testicular disorders, help-seeking intentions for testicular symptoms, and preferred learning strategies regarding testicular disorders. The intervention was underpinned by three behaviour change theories.

Results:

The intervention features a virtual model of testes that men can interact with using a virtual reality headset and joystick. A voiceover accompanies the intervention to provide prompts. The intervention comprises three scenarios aimed at familiarizing men with: (1) the normal testes, (2) common testicular symptoms, and (3) diseases including epididymitis, torsion, and cancer.

Conclusion:

This novel strategy can help familiarize men with their own testes and can raise their awareness of common testicular problems. The plan is to conduct a feasibility/pilot study followed by a randomized controlled trial.

P:84

Aging and the Microbiota-Gut-Brain Axis: Increased gut permeability, altered gut microbiota composition and increased peripheral inflammation are associated with neurobehavioural effects in aged mice

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Aging is associated with a number of adverse symptoms related to physical and mental decline, including immune dysfunction, cognitive impairment and altered mood. The mechanisms underlying these effects are unknown, but stress and inflammation are strongly implicated. The gut microbiota is also known to modulate stress, inflammation and aging. Moreover, interest has arisen in the role of gut permeability on aging. Better understanding of these processes may enable us to prevent or ameliorate some adverse aspects of aging. To this end we characterised differences between young and aged male mice, with particular attention to the microbiota-gut-brain axis.

Aged mice demonstrated an increase in anxiety-like behaviour as assessed by open field test and elevated plus maze. They also exhibited impaired social recognition as assessed by the 3-chamber test, failing to demonstrate a preference for a novel over a familiar conspecific, as normally observed. Aged mice also demonstrated impaired spatial recognition in the object displacement test.

At a physiological level, aged mice exhibited altered neuroendocrine responses to forced swim and restraint stress, characterised by delayed or blunted corticosterone responses. Increased gut permeability was observed in aged mice, which correlated with an elevation in plasma pro-inflammatory cytokines IL-6, TNF-α and IL-1β. The caecal microbiota was also significantly altered in aged mice towards a profile that has been previously associated with inflammation.

Our results suggest that changes in gut microbiota composition, gut permeability and elevated circulating pro-inflammatory cytokines may contribute to the development of some of the negative neurobehavioural symptoms associated with pathological aging.

P:85

Is Care an Art Form? Reflections on Forum Theatre for carers of people with dementia.

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Central to the social psychology and biomedical modalities of care for a person living with dementia, is the issue of subjectivity. Despite clear moves to Person Centred Care (PCC), care modalities for persons with dementia are still based widely on the medicalization of dementia. At the sharp end of these medical modalities are institutionalization and pharmacological interventions and containment. Such modalities are often a result of lack of facilities and resources to care for those with dementia. However, current thought, places the need for investment in community care, and away from institutional care. This presentation examines briefly different care modalities for those with dementia, and examines in detail the development of a forum theatre project for carers of those with dementia.

The presentation will conclude that the validation of a person with dementia's realities by carers is a mirroring of the somatic and cognitive changes associated with dementia. Finally, this presentation will discuss the possibility of reimagining care as an art form.

P:86

Design and implementation of a cadaveric based surgical skills workshop in a graduate entry to medicine curriculum.

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Anatomy is a core curriculum component of medical education.Recent years have seen the successful integration of “Clinical skills” into the early years of medical programs, “surgical skills” are not encountered until later in the program. As anatomical education occurs prior to surgical education, a theory-practice divide exists between both disciplines. To address this, we designed and implemented a two-day cadaveric-based “surgical skills and procedures” workshop for 2nd year medical students at University College Cork. Respondents filled a Likert-style pre- and post-training quantitative questionnaire (90% response rate) regarding their opinion on the anatomical knowledge and its influence on career. A qualitative questionnaire was also distributed. During the course, students learned the principles of scrubbing, handling surgical instruments, abdominal incision, basic-suturing, knot-tying, venous cut-down and bowel anastomosis. Prior to workshop, 85%studentsdisagreed regarding anatomy playing a minor role in preparing students for surgical career ($P < 0.001$). Majority of respondents were interested surgery as a career whereas a few wanted to improve their knowledge of anatomy and surgery. Post-training, 94.44%respondents agreed that inclusion of basic surgical skills course in undergraduate anatomy modules will benefit them to apply anatomical knowledge in practice in a simulated clinical environment ($P < 0.001$). Furthermore, 72.22% of students agreed that surgical skills’ course was constructive and educationally beneficial ($P < 0.001$). We conclude that the logistics of implementing a BSS course in the early years of a medical program are manageable, educational and is an enjoyable learning experience for the students.

P:87

The association between weight perception and BMI: Report and measurement data from the Growing Up in Ireland cohort study of 9-year olds

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Background

The gold standard for categorisation of weight status is clinically measured BMI but this is often not practical in large epidemiological studies.

Objectives

To determine if a child's weight perception or a mother's perception of a child's weight status is a viable alternative to measured height and weight in determining BMI classification. Secondary outcomes are to determine the influence of a mother's BMI on her ability to categorise the child's BMI and a child's ability to recognise his/her own BMI.

Methods

Cross-sectional analysis of the GUI cohort study. Variables considered for this analysis are; child's gender, measured BMI and self-perceived weight status, mother's weight perception of the child, measured BMI and self-perceived weight status. Cohen's weighted Kappa was used to evaluate the strength of the agreement between pair-wise combinations of the BMI variables. Cumulative and adjacent categories logistic regression were used to predict how likely a person rates themselves as under, normal or overweight, based on explanatory variables.

Results

Mothers are more accurate at correctly classifying their child's BMI (k=0.5;CI 0.38-0.51) than the children themselves (k=0.25;CI 0.23-0.26). Overweight mothers are better raters of their child's BMI (k=0.51;CI 0.49-0.54), compared to normal (k=0.44;CI 0.41-0.47) or underweight mothers (k=0.4;CI 0.22-0.58). The mother's perception of the child's weight status is not an influencing factor on the child's ability to correctly classify him/herself, but the child's self-perceived weight status influences the mother's ability to correctly classify the child.

Conclusions

A mother's BMI classification of her child is a viable alternative to BMI measurement in large epidemiological studies.

P:88

Does observational hand hygiene auditing reduce the incidence of bacteraemia? A retrospective time series analysis with control group.

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Background

Observational hand hygiene auditing (OHHA) involves a trained observer monitoring healthcare worker compliance with five identified moments for hand hygiene. The effectiveness of OHHA is uncertain despite widespread adoption.

Aims

To examine the effect of OHHA on the incidence of methicillin resistant *Staphylococcus aureus* (MRSA) and vancomycin resistant enterococci (VRE) bacteraemia.

Methods

We conducted a retrospective time series in four acute hospitals in the Republic of Ireland over the period 2009 to 2014. The OHHA intervention was introduced to three sites in 2011; the fourth site acted as a control and did not introduce OHHA. We compared the change in the incidence of methicillin resistant *Staphylococcus aureus* (MRSA) bacteraemia, vancomycin resistant enterococci (VRE) bacteraemia and alcohol based hand gel (ABHR) consumption, in intervention versus control sites.

Results

There was a significant reduction in MRSA bacteraemia in the control ($p<0.01$) but not the intervention ($p=0.77$) sites over the study period. When the difference of the differences was compared there was no statistically significant difference ($p=0.09$) between intervention and control sites. There was no significant reduction in VRE bacteraemia in the control ($p=0.18$) or intervention ($p=0.42$) sites. There was a significant increase in ABHR consumption in the intervention ($p<0.01$) sites and a decrease in ABHR consumption in the control ($p<0.05$) site. When the difference of the differences was compared this was not statistically significant ($p=0.07$) in either the intervention or control sites.

Conclusion

The implementation of OHHA does not appear to be associated with a reduction in bacteraemia or with an increase in ABHR consumption.

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Physical and psycho-somatic health outcomes in people bereaved by suicide compared to people bereaved by other modes of death: a systematic review

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Introduction: Little research has been conducted to investigate the physical health implications of suicide bereavement compared to other causes of death. There is some evidence that suicide bereaved parents have higher morbidity, particularly in terms of chronic illness. This systematic review aims to clarify and compare the physical and psycho-somatic morbidities of people bereaved by a family member's suicide death with family members bereaved by other modes of death.

Methods: MEDLINE, EMBASE, CINAHL, and PsycINFO were searched from 1985 to February 2016. Peer-reviewed, English language articles comparing suicide-bereaved family members to non-suicide bereaved family members on measures of physical or psycho-somatic health were eligible for inclusion. Cohort, cross-sectional, case-control and cohort-based registry studies were eligible for inclusion. A modified version of the Newcastle Ottawa Scale was used for quality assessment. Narrative synthesis was used to synthesise results.

Results: The literature search located 26 studies which met the inclusion criteria. A number of the registry-based studies found that suicide-parents were at substantially increased risk of a number of diseases, including cancer, cardiovascular disease, hypertension, diabetes and chronic obstructive pulmonary disease.

Conclusion: This review contributes to the evidence base. However, there is insufficient evidence to come to a definitive conclusion regarding suicide bereavement and physical and psycho-somatic health outcomes. Future research should examine health risk behaviours of suicide-bereaved and non-suicide bereaved family members to examine whether any differences in health status may be related to such behaviours.

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Development of Tumour Therapy and Imaging Strategies Utilising Bacteria

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Bacterial colonisation of solid tumours has been observed for over 120 years. However, it is only in recent times that the ability of systemically circulating bacteria to target tumour sites and colonise tumours to a high level has been exploited for diagnosis and therapy. The tumour localised growth of administered bacteria allows for the site specific activation of prodrugs and the elicitation of a therapeutic effect which is confined to the tumour site without the undesirable off-target effects that are associated with most chemotherapies. The endogenous array of bacterial enzymes that are absent from mammalian cells provides for the targeted and simultaneous activation of a range of prodrugs within the tumour. Our group has developed a therapeutic strategy that relies on bacteria directed activation of a prodrug cocktail within subcutaneous CT26 tumours. Natural levels of bacterial enzymes have been shown to be sufficient for targeted prodrug activation and the elicitation of a therapeutic response without the need for genetic modification of bacteria. In parallel to this therapy, we have also developed optical imaging strategies for the non-invasive *in vivo* detection of bacteria. This imaging tool can be combined with bacteria directed enzyme prodrug therapy to build a theranostic platform for the detection and treatment of solid tumours *in vivo*. Our work introduces the concept of exploiting endogenous bacterial enzymes for tumour therapy and imaging of wild-type bacteria. This system may also be extended to other research fields such as infectious disease and can be adapted for use with alternative imaging modalities.

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A study to define the microbiome of the Asthmatic airway

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Background:

Until recently, the lower airways were thought to be sterile unless infected; however molecular methods have demonstrated that airways harbour a distinct microbiome. This has changed respiratory research with a need now to consider the effects of host–microorganism interactions in both healthy and diseased lungs. The aim of our study was to characterise the lower airway microbiota in a cohort of well-defined asthmatics.

Methods:

We recruited 90 patients, stratified by asthma severity to our study. All patients were clinically evaluated by ACQ-7, spirometry, FeNO, serum IgE/RAST and eosinophil levels prior to bronchoscopy and bronchoalveolar lavage (BAL), obtained from either the right middle lobe or lingula. Cell differentials were performed on BAL, which was further evaluated for the presence of microbes, microscopically and by qPCR.

Results:

Microscopic evaluation of patient BAL and biopsies demonstrated; BAL macrophages containing numerous microbial species and numerous bacteria adherent to lung epithelia. Molecular analysis detected the presence of Firmicutes and Proteobacter especially those of clinical importance (*Pseudomonas, Escherichia, Bordetella*). *Prevotella*, *Veillonella* and the atypicals, *Mycoplasma pneumoniae* and *Chlamydophilia pneumoniae,* were also detected. We have also observed the presence of Aspergillus which is under-reported in the asthma population to date.

Conclusions:

Our results demonstrate the presence of microbial species within the previously considered sterile airway of asthmatic patients. The presence of differing species within the airway may provide a rationale for personalized therapeutic targeting of microbes within the asthmatic lung.

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A mHealth App with Game for Adult Cystic Fibrosis Patients

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Introduction: CF is the most common life limiting genetic disease affecting Caucasians and Ireland has the highest occurrence of this disease in the world. Thanks to recent developments in CF therapy and treatments, life expectancy for these patients is expected to rise. Hence this research presents an mHealth app with well-being questionnaire and game targeted at the adult CF population. The game is based on Flappy bird, however the patient must control the movement of the bird via blowing into the microphone. A web tool was also created to allow the CF health care team to view a patient's game performance and questionnaire data. SMS alerts are also sent to a patient based on the data collected. The parameters of these alerts can also be edited by the CF health care team through the app to provide a more individualised analysis.

Methodologies: The app was created for Android and the web tool was created using HTML, Javascript, PHP, MySQL and a text api.

Evaluation: Three patients were then given the app to use over a two month period as part of a preliminary stress test.

Discussion: On comparing the data between two of the patients it was found that therapy compliance as recorded through the questionnaire had an obvious effect on game performance. With patient 1 reaching levels 2-4 in the game with 100% recorded therapy compliance, and patient 2 reaching 0-1 with <50% therapy compliance). Future developments include incorporating these findings into the app and analysis system for patients to view the practical effects of therapy compliance.

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Medical outcomes post transition of clinical care from a paediatric cystic fibrosis care model to an adult cystic fibrosis care model – an Irish perspective

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As life-expectancy increases in CF it is paralleled by an increasing number of patients transitioning from a paediatric care-model to an adult care-model. In chronic illnesses' including CF the transition process is often complicated by concerns about the potential implications. Traditionally studies have evaluated subjective aspects of transition including patient satisfaction. There are limited objective studies in this area. Our study investigated the change in clinical status in the year pre & post transition.

Data was collected retrospectively for the year pre-transition and the first year post-transition for the last 28 patients who transitioned from our paediatric to adult program. FEV_1, FVC, BMI, number of pulmonary exacerbations were recorded.

There was no significant difference in the mean decline in FEV_1 (*p=0.66*) or FVC (*p = 0.248*) in the year pre-transition compared to the year post. There was a significant decrease in the total number of exacerbations (PO & IV antibiotics) in the year post- transition (*p = 0.015*). There was no significant change in the number of exacerbations requiring IV antibiotics (*p = 0.568). A* significantincrease in use of home IV antibiotics was noted after transition (*p = 0.006*) with a parallel non-significant reduction in number of inpatient days (mean -2.35 days, *p = 0.211*). There was no significant change in BMI after transition (*p = 0.66*).

In a cohort of patients with CF transition is not associated with a clinical decline; however, it is associated with a change in antibiotic practice - with a reduction in oral antibiotic usage and a change in location of IV antibiotic delivery.

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Psychological wellbeing, HPA activity and sleep patterns in a population of nulliparous pregnant women.

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Sleep disturbances are common during pregnancy and have been linked to altered birth outcomes (1) (2). Increased prenatal stress as a result of sleep impairments may contribute to this relationship (3). This study aimed to determine the relationship between sleep quality and psychological and physiological readouts of stress during pregnancy. Nulliparous pregnant women were asked to provide saliva samples and complete the Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale (PSS), State Trait Anxiety Inventory (STAI) and Edinburgh Postnatal Depression Scale (EPDS) between 14-17 weeks gestation. The prevalence of pregnancy-associated sleep disturbance (PSQI >5) was 55.26% (N=37). The mean PSS, STAI and EPDS score was 15.38 ± 0.682 (> 16 'high'), 4.86 ± 0.615 (> 5 'high') and 5.108 ± 0.723 (> 6 'high') respectively. Women with poor sleep quality were 4 times more likely to score high on PSS (OR=4.28, [95% CI: 1.08–17.00; p=0.039]). Good sleep quality was associated with a cortisol peak 30min after waking (P<0.0351 *), which returned to baseline by 60 minutes, and continued to decline thereafter. Women with poor sleep quality did not display any difference in cortisol levels. This study confirms an association between poor sleep quality and high levels of perceived stress in pregnancy. Interestingly, women with poor sleep quality have a blunted Cortisol Awakening Response, suggesting a diverging impact of poor sleep quality on psychological and physiological readouts of stress. Such alterations in HPA activity in pregnancy may be a mediator linking poor sleep quality with altered pregnancy and birth outcomes.

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Inflammasome signalling regulates neuro-immune interaction in antibiotic treated mice

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A balance between the intestinal commensal microbiota, the immune system and the nervous system is essential in maintaining gut homeostasis. Environmental factors such as diets and antibiotic treatment results in alterations in any of these systems, which affect the development of several conditions including autism, irritable bowel syndrome and inflammatory bowel disease. The inflammasomes are key mediators of innate immune responses against bacteria and harmful stimuli. Inflammasome activation results in the maturation of caspase-1 and interleukin (IL)-1β and IL-18, two pro-inflammatory cytokines involved in both gut homeostasis and pathophysiology of several inflammatory conditions. Factors regulating the neuro-immune axis in mice with antibiotic-disrupted microbiota are poorly investigated. In this study, wild type (WT) and caspase-1 deficient (casp-1KO) were treated with antibiotics (Abx) for 2 weeks and neuro-immune interactions were analysed by RT-qPCR, flow cytometry and intracolonic capsaicin treatment. Antibiotic-treated WT-mice presented alterations in colonic T cellsand macrophages and in central neuroimmune interactions, activation of colonic inflammasome and nociceptive receptor genes as well as a reduction in capsaicin-induced visceral pain responses. In contrast, Abx-treated casp-1KO mice, presented a significant attenuation in all the tested neuro-immune responses. Collectively these data provide new insights into inflammasome-gut microbiota-nervous axis which can offer potential new treatments for conditions with altered microbiota composition.

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Novel Investigations of Central Oxytocin Receptor Signalling and Crosstalk in the Microbiota-Brain-Gut Axis

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Alterations in intestinal microbiota are being linked to brain development and behavior and the concept of a microbiota-gut brain axis has emerged (Cryan and Dinan, 2015). Autism spectrum disorders (ASD) is a poorly understood neurodevelopmental brain disorders with clear genetic and environmental influence, and a role for the gut microbiota has been suggested. Altered circulating levels of oxytocin (Husarova VM, Et al., 2016) and ghrelin (Al-Zaid FS, et al., 2014), both key signalling hormones within the brain-gut axis, have been implicated in patients with ASD. Moreover, both ghrelin levels (Duca F, et al.,2012) and oxytocin secretion (Buffington AS, et al., 2016) have been shown to be correlated with alterations in microbiota composition.

Oxytocin is one of the few treatments to show benefit in attenuating social deficits in ASD (Guastella et al., 2009); enteric bacterially produced short-chain fatty acids (SCFA) associated with the breakdown of fibre by colonic bacteria have also been implicated in the behavioural exacerbations of ASD (MacFabe et al., 2012). Additionally, certain lactobacilli strains increase oxytocin concentrations in mice via neuro-immune actions (Poutahidis et al., 2013).

Here, we show effects of acetate, butyrate and propionate on G-protein receptor (GPCR) signalling, including the oxytocin receptor and the ghrelin receptor 1a. We have also explored novel crosstalk and dimerization of the oxytocin receptor with the ghrelin 1a and vasopressin 1a receptors and its effect on downstream signaling. Together this data further highlights the microbiota-brain-gut axis as a key regulator of central GPCR signaling, which may play a key role in social development and associated deficits.

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The Patient Held Active Record of Medication Status (PHARMS) Feasibility Study

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Introduction:

Medication errors are a major source of preventable morbidity, mortality and cost. The primary-secondary care interface at time of hospital discharge has often been associated with medication error. As the patient is the one constant during transitional care a secure password protected electronic patient held medication record has been developed.

Aims:

To establish the impact of introducing a patient held active record of medication status (PHARMS) on the discharge process.

Outcomes of interest:

- Acceptability and usefulness of the device to patients, hospital doctors and GPs
- Prevalence and types of prescribing error on discharge prescriptions
- Identification of barriers to the implementation process

Methods:

A non-randomised feasibility study is being conducted among patients ≥60 years from four urban GP practices admitted to the Mercy University Hospital, Cork. Eligible patients are issued with an electronic medication record linked to their medication record in primary care. The device is used by the hospital doctor at time of generation of the discharge prescription. Discharge medication information is transmitted electronically to the patient's primary care record. Prevalence of prescribing errors on discharge prescriptions will be estimated using RCGP guidelines and Controlled Drug legislation. Semi-structured interviews with a purposive sample of patients, hospital doctors, GPs and IT staff are ongoing.

Results (preliminary):

130 patients have been recruited to the study: 66 control and 64 intervention patients. Successful communication of medication information between secondary and primary care has occurred at time of hospital discharge for 44 of the patients to whom devices have been deployed.

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Rising Demand for Informal Carers in Ireland – What is the Status on Employment?

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As the Irish population ages the demand for caregiving, particularly informal care, is set to increase. However, the supply of informal carers is restricted and individuals' decision to provide informal care may come at a cost.

Selection bias may exist in the relationship between informal caring and formal employment. It may be that having caring duties affects an individual's ability to participate in the labour force. Furthermore, being in employment might impose restrictions on an individual's ability to provide the sufficient amount of elderly care required.

Using QNHS-Q3 2009 data propensity score matching is employed to overcome selection bias in an attempt to estimate the effect size between informal caregiving and labour force participation. Further analysis is conducted on the factors predicting informal care provision.

Results suggest that differences do not exist between carers and non-carers with respect to their employment in Ireland. Thus, the probability of informal caregiving does not affect the decision to participate in the labour force. This may suggest that if the informal caregiving needs are inflexible, individuals might be forced to reduce time spent in other activities to participate more in the labour market, whilst maintaining informal care provision.

The results also reveal that informal carers in Ireland exhibit characteristics in line with what are traditionally seen as informal carers: married, women aged over 40 years. This presents a worrying trend for the future supply of informal carers in Ireland and longer term implications for informal carers who must continue to also remain in employment.

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Influences on Decision–Making Regarding the Prescription of Antipsychotics to Nursing Home Residents with Dementia: A Systematic Review of Qualitative Evidence

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Aims: Antipsychotic prescribing is prevalent in nursing home residents with dementia, despite the known risks and limited evidence of benefit. Many studies have attempted to understand this continuing phenomenon utilising qualitative research methods. However, no study has ever attempted to synthesise this qualitative evidence with the aim of developing novel insights to better understand the influences on antipsychotic prescribing from various perspectives.

Methods: Six databases were searched electronically from inception to July 2016. This search was supplemented by hand searching of journals and conference abstracts. Studies were included if they utilised qualitative methods of both data collection and analysis, and explored antipsychotic prescribing in nursing homes. The Critical Appraisal Skills Programme (CASP) assessment tool for qualitative research was utilised to assess risk of bias. The 7-step meta-ethnographic approach was utilised to synthesise studies. The Confidence in the Evidence from Reviews of Qualitative research (CERQual) approach was utilised to assess the confidence in individual review findings.

Systematic Review Registration: PROSPERO CRD42015029141.

Findings: Of 1530 articles identified, 17 met the inclusion criteria. Analysis is ongoing but preliminary findings would suggest that a lack of knowledge by nursing home staff regarding the management of responsive behaviours, combined with the fear by family members of their loved ones losing their dignity (by reverting to these behaviours) may be contributing to inappropriate requesting of antipsychotics from prescribers.

Discussion: This systematic review will identify the influences on antipsychotic prescribing to nursing home residents with dementia, and will assist with the development of future targeted interventions.

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Peripheral Nerve Blocks and Perioperative Analgesic Outcomes

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Introduction: Peripheral nerve blocks (PNBs) are increasingly used for both surgical anaesthesia and post-operative analgesia. Although PNBs are widely used at Cork University Hospital (CUH), information on block success and perioperative analgesic efficacy is lacking. These audits aim to characterise the success of commonly performed PNBs, and offer objective insight to inform clinical practice change.

Method: Starting in June 2015, we conducted a prospective audit of PNBs performed in the perioperative setting at CUH over six weeks. PNBs were assessed for loss of motor and sensory function. Pain in the post-anaesthesia care unit (PACU) was measured using numerical rating from 0 to 10.
In January 2016, the findings were discussed at a meeting of consultant anaesthetists. Recommendations for alterations to practice were derived from the audit data.
In June 2016, having made the clinical practice changes, we conducted an analogous prospective audit.

Results: In the 2015 audit, a total of 104 PNBs were assessed. Data relating to success rates and postoperative analgesia is presented in Table 1.
Of note, 47% of patients undergoing ankle surgery, did not receive combined popliteal and ACB blocks. Analgesia was unsatisfactory in this group, with a reported median pain score of 3.5 [0-6]. In the 2016 audit, all patients received combined blocks for ankle surgery. Patients with both a successful popliteal block and successful ACB, reported pain scores of 0.

Conclusion: We conclude that administration of the ACB in addition to the popliteal block to patients undergoing ankle surgery provides satisfactory postoperative analgesia for this group. Block success rates in CUH have improved 2015-2016.

Table 1.

		2015 Audit Data		2016 Re-audit Data	
Region	**Block Type**	**Block Success Rate**	**Median Pain Score in PACU [range]**	**Block Success Rate**	**Median Pain Score in PACU [range]**
Upper Limb	**Axillary**	86.60%	0 [0-4]	83.30%	0 [0]
	Infraclavicular	40%	0 [0]	50%	0 [0]
	Interscalene	25%	0 [0-8]	50%	3.5 [0-7]
	Supraclavicular	71.40%	0 [0-8]	75%	0 [0]
	Radial	100%	0 [0]	NA	NA
	Ulnar	0%	0 [0]	100%	0 [0]
	Median	66.60%	0 [0]	NA	NA
Lower Limb	**Femoral**	58.30%	0 [0-8]	86.70%	0 [0-6]
	Popliteal	71.40%	0 [0-6]	70%	0 [0-7]
	ACB	100%	0 [0]	80%	0 [0-7]

Notes: