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Abstract
The following abstracts are those that were presented at the research competition of the Student Medical Summit held in University College Dublin on the 9th February 2019. For more information about the Student Medical Summit visit www.studentmedicalsummit.org or contact info@studentmedicalsummit.org.

Keywords: SMS; undergraduate research conference; poster competition; medical research; biomedical research

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Conference Abstracts
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Poster Abstracts

1. A comparison of 3d printed anatomical models against tissue equivalent models under x-ray conditions

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Introduction: Three dimensional (3D) printed anatomical models are used alongside traditional cadaveric prosections to enhance medical education. Multi-material 3D-printing involves combining different types of material in a single print and is technically challenging compared to single material printing. The aim of this project was to utilize X-ray imaging to assess radiographic tissue equivalency of 3D-printed materials and hence produce a radiographic-phantom of hip joint.
Methods: Freely available 3D anatomical models were downloaded from BodyParts3D and imported into Fusion 360 for further processing. Models were then exported as stereolithographic (stl) files and imported into freely available slicing software Slic3r for generating Gcode. The models were printed on Prusa i3 MK2S MMU and imaged under CR (Computed-Radiography) X-ray imaging. ImageJ (Fiji) was used to calibrate resultant images and to measure mean pixel-intensities of 3D-printed objects. Results were recorded and graphs generated.
Results: Plates of increasing thicknesses were printed in four different materials (polylactic-acid (PLA), polyethylene-terephthalate-glycol (PETG), polymethyl-methacrylate (PMMA) and acrylonitrile-styrene-acrylate (ASA)). For even the thickest plates, (10mm), the mean pixel-intensity for all four materials was considerably less than a pre-existing radiographic-phantom (Phantom-60.258, ASA-11.451, PLA-9.627, PETG-11.019, PMMA-7.256). Hip models were produced at 50% scale with varying shell-thicknesses (5, 10, 15mm). 15mm shell-thickness was identified as the optimal choice for radiographic-phantom mimicry.
Conclusion: Given the similar mean pixel-intensity values for these four materials, hip models were produced in PLA because of its affordability, ease of use and compatibility with other materials. A series of 3D-printed (normal and fractured) hip joints were produced to be used as teaching models and radiographic-phantoms.

2. Targeted knockdown of specific oxygen sensing prolyl hydroxylase enzymes using siRNA

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Introduction: Each cell of the body can evoke an endogenous response to hypoxia through activation of a master transcriptional regulator known as the hypoxia inducible factor (HIF). The body senses hypoxia through a group of three prolyl hydroxylase domain containing proteins (PHDs) and an asparagine hydroxylase (FIH). In hypoxia, PHDs and FIH are inhibited, allowing HIF to accumulate and produce a hypoxic response through transcriptional upregulation of several hundred genes. Pharmacological inhibitors of PHDs are proven to be effective in providing protection to tissues in hypoxic diseases such as Inflammatory Bowel Disease (IBD). However, these drugs lack specificity to members of the PHD family and the specific isoforms of HIF they target. Therefore, it would be beneficial in the development of new therapies for hypoxic diseases such as IBD to determine whether specific inhibition of members of the PHD family produce a more beneficial or disadvantageous response.
Methods: Treatment of HEK293T with pharmacological hydroxylase inhibitors, 1M dimethyloxalylglycine (DMOG) and 100mM JNJ-42041935 (JNJ). Transient transfection of HEK293T cells using short interfering RNA (siRNA) targeting PHD1, 2 and 3 in isolation. Western Blot analysis to detect alterations in HIF isoform expression due to pharmacological and siRNA targeting.
Results: siRNA induced inhibition of PHD2 is possible, however, no alterations in stabilisation of either isoform of HIF is observed.
Conclusion: Further work must be carried out in this field to explore if specific genetic knockdown of PHDs holds the potential, in the context of hypoxic diseases, to stabilise the more preferential HIF isoforms over the less advantageous.

3. Hormonal and reproductive factors and subsequent risk of haematological malignancy subtypes

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Introduction: Haematological malignancies (HM) are male dominant; the reasons for which remain unknown. Immunomodulatory exposures reportedly increase HM risk leading to speculation that female sex hormones, which exert immunomodulatory effects, may protect against HM development in women. We investigated the association between hormonal and reproductive factors and subsequent risk of HM in a large cohort within the United Kingdom (UK).
Methods: The UK Biobank is a large prospective cohort study of 502,628 men and women aged 40 to 69 years recruited from 2006-2010. Information on hormonal and reproductive factors was obtained from participant's baseline assessments. Hazard ratios and 95% confidence intervals were estimated using Cox proportional hazards models, adjusting for potential confounders.
Results: A total of 2,362 HMs occurred during 8 years of follow-up. For females, in adjusted analysis, age at first birth, bilateral salpingo-oophroectomy, menopausal status and age of menopause were associated with increased significant risks of HM subtypes including non-Hodgkin's lymphoma (NHL), Hodgkin's lymphoma and myeloproliferative neoplasms. For males, average/older age of first facial hair onset and average age of voice breaking were significantly associated with a reduced risk of developing NHL, FL and chronic lymphocytic leukaemia.
Conclusion: Preliminary analysis of this large population-based cohort suggests a number of female and some male reproductive factors, used as proxies for sex steroid hormone exposure, may confer different risks by HM subtype. Given the limited studies in this area, future work particularly focusing on male hormonal and reproductive factors is warranted.

4. Prevalence of non-prescribed drug use in hospital patients assessed by urine toxicology testing

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Introduction: To analyse the results of a survey for non-prescribed drug use in selected patient populations in Tallaght University Hospital to determine the patterns of drug use by urine toxicology testing.
Methods: Urine toxicology screening results done by the Alere Triage® TOX Drug Screen Meter were extracted from the Clinical Chemistry Lab's database from the 5th of March to the 23rd of March at Tallaght University Hospital. Results were analysed to determine which drug tested positive most commonly.

Results: Benzodiazepines were the most prevalent DOA in urine toxicology, accounting for 25.62% of all positive results, this was followed by Cannabis and Amphetamines with 21.67% and 20.20% respectively. The largest age group that presented was between 30-39 inclusive.
Conclusion: Benzodiazepines are the most prevalent positive result in DOA screens in Tallaght University Hospital and the 30-39 age group contained the most positives and number of samples sent for toxicology analysis, supporting the claims of recent literature.

5. Generation of an *in vitro* mammosphere culture system for analysis of the breast cancer cell line MCF7 microenvironment

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Introduction: Three-dimensional (3D) cell culture models are rapidly becoming the method of choice for in vitro screening of novel biotherapeutic therapies. They represent a unique possibility to recapitulate the in vivo physiological characteristics of solid tumours in an in vitro setting [1]. 3D culture provides the ability to more accurately study secreted factors that influence adjacent cell behaviour, controlling the cells ability to proliferate and metastasise [2]. The aim of this research was to (a) establish a robust method to culture the breast cancer cell line MCF7 to create 3D spheroids or 'mammospheres' and (b) characterise the MCF7 microenvironment.
Methods: The commonly used breast cancer cell line MCF7 was cultured in a synthetic basement membrane (Matrigel™) to create 3D mammospheres. These mammospheres were then probed with protein specific antibodies to characterise the MCF7 mammosphere microenvironment using imaging and proteomic analysis. The formation of MCF7 mammospheres was documented daily using light microscopy, and at full culture term using confocal microscopy.
Results: MCF7 formed small irregular masses of cells rather than round colonies with organised nuclei as produced in the breast cancer cell line MCF10A. Western blot analysis indicated the secretion of the glycolytic enzyme alpha-enolase in 2D culture. The 3D culture media did not produce a positive result for the targeted secreted proteins, suggesting further optimisation of the protocol is required.
Conclusion: The results demonstrate that culturing of MCF7 mammospheres to characterise their microenvironment is possible. Once optimised, this culturing technique could further information on the tumour microenvironment, elucidating novel biomarkers and physiologically relevant therapeutic targets.

6. Clinical prognostic biomarkers in chronic lymphocytic leukaemia, and an associated study of NOTCH1 mutation status and cytoskeletal abnormalities

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Introduction: This study observes the deletion of a CT-dinucleotide in the NOTCH1 (p.P2515Rfs*4) gene, resulting in a NOTCH1 protein without a C-terminal domain. Loss of the domain's PEST sequence results in an aggregated active protein-isoform within CLL cells. Mutated NOTCH1 proteins occur in 6-10% of CLL cases, conferring an increase in patient morbidity and cytoskeletal abnormalities that result in smudge-cell formation. This study explores the association between NOTCH1 mutations and smudge-cells, as well as haematocrit values, CD38 expression and CD20-MFI.
Methods: CD38 expression and CD20-MFI was analysed using flow-cytometry at St. James's Hospital. Smudge-cell percentage was determined by microscopic evaluation of Wright-Giemsa stained blood samples. NOTCH1 mutations were identified using PCR. Paired two sample t-test and chi-squared test were used to evaluate differences between NOTCH1-mutant and wild-type groups.

Results: Between 2015 and 2018, 23 patients were enrolled onto this study and had peripheral blood smears and peripheral blood mononuclear cells available for analysis. Median smudge-cell count was 25.5 (range, 7-117.5). Lower smudge-cell counts, although not statistically significant, were observed in NOTCH1-mutant cells. CD20-MFI in CLL cells was 7.7 (range, 1.9-31). CD-20 MFI was lower in NOTCH1-mutant than wild-type patients. No statistically significant correlation between NOTCH1 mutational status and CD38 status in patients. NOTCH1-mutant cells had higher haematocrit percentages than wild-type cells.
Conclusion: NOTCH1 mutation status is not associated with cytoskeletal abnormalities. NOTCH1-mutated cases present with lower smudge-cell counts and CD20-MFI, but higher HCT values. A lower smudge-cell count confers a poorer prognosis. HCT could be investigated as an easily-obtained prognostic marker, in future investigations.

7. Social capital and mental health among black and minority ethnic groups in the UK

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Introduction: Black and minority ethnic communities appear to be at greater risk of mental health problems in the UK.
Methods: Our aim was to explore differences in the mental health status and social capital among ethnic minority groups compared to the white British population, and determine predictors for psychological distress and how they differ for men and women. An analysis of cross-sectional data from Understanding Society Wave 6 was implemented to examine the relationship between ethnicity, gender, social capital and psychological distress.
Results: Among men, White and 'Other' ethnic minority groups were more likely to report low social capital, while among women, Mixed, Caribbean, African and Other ethnic groups were more likely to report low social capital. Being female, unemployed, not married, or having children, or owning one's home, and having a low sense of British identity or social capital increased the odds for psychological distress. Indian and Pakistani ethnic minority females were more at risk of mental health problems than their White UK counterparts. Among males, only Indians appear to be at greater risk. Among females, increased risk was uniquely determined by low education attainment, married and having no children and being born in the UK, while among men, unemployment was key.
Conclusion: If, as our findings suggest, minority ethnic mental health is influenced by social capital, there is a strong argument to seek interventions to increase social capital for at risk groups.

8. A retrospective review of the quality of care in patients with failed kidney transplants: a single-centre experience

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Introduction: The quality of care provided to patients with failing kidney transplants has been shown to be suboptimal in prior reports. However, a more recent review of this issue in a contemporary Canadian cohort has not been undertaken.
Methods: We conducted a cross-sectional study of all adult kidney transplant recipients (KTR) who received their first transplants at Toronto General Hospital from January 1, 2000 and experienced allograft failure by December 31, 2015. Suboptimal dialysis starters (SDS) had dialysis initiated as inpatients, while optimal dialysis starters were initiated as outpatients. SDS were categorized as avoidable vs. unavoidable (i.e., patients with rapid decline of eGFR (CKD-EPI) by over 5 ml/min/1.73m2 within 30 days).
Results: A total of 303 KTR experienced graft failure over study follow-up. Sixty-five percent were Caucasian and median age at graft failure was 53 years. The prevalence of SDS was 58% (n = 104/178). Odds ratio was 1.03 in the logistic regression model for effect of recipient age at graft failure on dialysis initiation in SDS [OR = 1.03 (1.00, 1.06), P-value = 0.04]. Among SDS, 62 (60%) and 42 (40%) were unavoidable and avoidable, respectively. Half or more in each SDS group (n = 21 avoidable and n = 41 unavoidable starts) were initiated on hemodialysis with CVC access.
Conclusion: Majority of failed KTR were SDS, with 40% being potentially avoidable. Given the large proportion of avoidable SDS, there is a need for more timely referral to kidney care clinics and better planning for chronic dialysis or re-transplantation.

9. The association between coronary artery disease and diagonal earlobe crease in men aged 60 and under

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Introduction: Coronary artery disease (CAD) is one of the leading causes of mortality and morbidity in the developed world. There are well established risk factors of cardiovascular disease. Most of these risk factors require specific investigations. Identification of simple clinical signs is thus very important in reducing the burden of disease. Diagonal earlobe crease (DELC) is a potential clinical sign for CAD.
Methods: Male patients presenting to the Acute Coronary Unit or had known history of CAD were assessed for the presence of DELC. Male patients admitted on the wards and without a history of CAD were used as controls. The association of DELC and smoking, hypertension, diabetes, dyslipidaemia were analysed. The severity of CAD among the interventional group were assessed as the number of diseased vessels on Computed Tomography Angiography results.
Results: 72 individuals were included in the study, 40 of which were controls. Among the 32 with CAD, 16 had DELC present (50%) compared to 6 (15%) of the control group. DELC was found to be associated with CAD ($p<0.001$). There was no correlation between DELC and smoking ($p<0.136$), dyslipidaemia ($p<0.465$), diabetes ($p<0.712$) and hypertension ($p<0.206$). There was no association between the severity of CAD and DELC ($p<0.512$). The mean age of the control group was 47± 11.15 compared to 54.36± 3.81 for the interventional group. DELC was associated with advanced age ($p<0.016$).
Conclusion: DELC was independently associated with CAD irrespective of disease severity. DELC should be used in the clinical assessment of patients suspected of CAD.

10. Investigation of the effect of the HTLV-2 antisense protein APH-2 on autophagy

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Introduction: Human T cell leukaemia virus type 1 and 2 (HTLV-1 & 2) are retroviruses that establish chronic lifelong infections of T lymphocytes. They are closely related in terms of structure, lifecycles and proteins expressed but have different clinical outcomes. HTLV-1 can cause adult T cell leukaemia/lymphoma (ATLL) while HTLV-2 is not clearly associated with disease. Much research has gone into, trying to unravel the mechanisms behind the different pathogenicity of these two viruses in order to identify key drivers of disease in HTLV-1 compared to HTLV-2. These studies will lead to the development of novel therapies.
HTLVs, like other viruses alter the activities of numerous cellular signalling pathways, usually for their own benefit. Autophagy is a cellular process involved in removing misfolded or aggregated proteins, eliminating damaged organelles and removing intracellular pathogens. It is also important in times of nutrient stress in order to balance energy sources. However, viruses use autophagy to promote their replication and survival in cells.
Methods: The aim of this project is to determine the effect of APH-2 on autophagy in terms of the accumulation of autophagosomes in cells expressing APH-2 compared to control cells by immunofluorescence. HeLa cells were transfected with GFP-APH-2 and mCherry-LC3 plasmids, either starved for 4 hours or not, immunostained for tubulin and observed by fluorescence microscope.
Results: We demonstrated that cells transfected with APH-2 displayed reduced levels of autophagy in both starved and non-starved cells, suggesting that APH-2 potentially inhibits autophagy.
Conclusion: Overall, we conclude that APH-2 inhibits autophagy in starved and non-starved cells.

11. A review of delays in administration of parenteral systemic chemotherapy in the day ward setting

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Introduction: National Cancer Control Programme recommends that patients start new parenteral systemic chemotherapy in the oncology day ward (DW) within 15 working days from referral. There is a lack of data concerning the delays before treatment starts and during treatment for medical oncology (MO) patients receiving intra-venous (IV) chemotherapy in the DW, which this study aims to explore.
Methods: This was a retrospective review of 65 MO patients who commenced first line IV chemotherapy in the UHG DW July–September 2017. The number of working days between referral and start of treatment was recorded and the schedule for

the first 10 weeks of treatment was investigated. Data were obtained from MOSAIQ oncology database and analysed using IBM SPSS 25. A significance level of 95% was used.
Results: 53.8%(n=65) of patients exceeded 15 days from referral until treatment started, of this 82.9% due to DW capacity and 17.1% for medical reasons. 43.1%(n=65) of patients received concomitant radiotherapy (RT); their mean rank and median delay until treatment [23.55&11.00] was lower than other patients [40.15&22.00](p<0.001). Delays before treatment showed no significant difference between curative and palliative regimens (P=0.222) nor between 2-weekly and 3-weekly regimens (p=0.058). Once treatment started, 1.5%(n=65) of patients had a delay due to DW capacity during the first 10 weeks.
Conclusion: Capacity is a major cause of delays for MO patients starting IV chemo on the DW, but causes minimal delays once treatment starts. RT patients appear to be prioritised in starting treatment above other MO patients.

12. What is the evidence for endoscopic therapy for pain relief in chronic pancreatitis?
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Introduction: The objective of this study was to evaluate the efficacy of endoscopic therapy for pain relief in patients suffering from chronic pancreatitis.
Methods: In order to gather evidence for the use of endoscopic therapy for pain relief in CP, we conducted a systematic literature review and focused on recently published guidelines for management of pain in CP. Following an initial search using the search engine PubMed, 25 papers met the inclusion criteria and were selected and reviewed.
Results: A systems-review of 25 papers evaluated the use of endoscopy in the treatment of chronic pancreatitis for pain relief as shown in Table 1. The total number of patients is 3892. Pain relief averaged 70.8% through endoscopy treatment where the highest rate of pain relief achieved was 94% while the lowest was 30.4%. The endoscopic treatment that was looked in this study ranges from EUS, ERCP and ESWL. Significance on pain relief between the different types of endoscopic treatment cannot be commented.
Conclusion: We agree that surgical route of treatment has better long term pain relief compared to endoscopic intervention. A multidisciplinary approach is best advised when selecting the appropriate patients for endoscopic therapy in pain relief for chronic pancreatitis.

13. Enhancement of colistin activity by combining with novel enhancing drugs HT0121567, HT0120225 and HT0120372 against antibiotic resistant *Escherichia coli*
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Introduction: Antibiotic resistance has rapidly become a worldwide threat to modern medicine. Cases of 'untreatable infections' are occurring increasingly often, and our current marketed antibiotics are losing effectiveness. The aim of this study was to find combinations of antibiotics and novel compounds that work synergistically to enhance antibiotic eradication of resistant strains of *Escherichia coli*.
Methods: The minimum inhibitory concentrations of gentamicin, ceftazidime, meropenem and colistin against *E. coli* strain 59 were obtained. The chequerboard method was used to screen for the best enhancer-antibiotic combinations between 12 novel compounds, and the 4 antibiotics, determined by fractional inhibitory concentration index (FICI). Viable combinations were subjected to further chequerboard assays against 23 clinical isolates of *E. coli*, and time-kill curve tests confirmed synergistic effects, with measurements taken over 48 hours.
Results: Combination of colistin with the compounds HT0121567, HT0120225, and HT0120372 were found to have synergistic activity against *E. coli* strains. Gentamicin, meropenem and ceftazidime displayed partial synergy with some compounds, but the majority of the FICI indicated no interaction between the antibiotics and novel compounds. Time-kill curve tests confirmed results of the chequerboard assays, with colistin working effectively with HT0121567, HT0120225, and HT0120372 to rapidly and completely eradicate log-phase bacteria with no regrowth.
Conclusion: Combination therapy using existing antibiotics and novel enhancing compounds could be an effective strategy against antibiotic resistance. The combined drugs are able to eliminate bacteria at lower concentrations, enhancing the potency of colistin, allowing for bacteria to be killed much more rapidly, thus reducing risk of resistance.

14. Investigating the role of galectin-9 in trophoblast invasion

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Introduction: Galectins play a crucial role in numerous cellular processes, including cell death, immune modulation and invasion. During implantation of the embryo, galectin-9 is expressed at the feto-maternal interface and regulates maternal immune tolerance. Successful implantation depends on physiological invasion of trophoblast cells, and this step shares many features with pathological tumour invasion. Galectin-9 has been previously shown to regulate tumour invasion, however its role in embryo implantation is poorly understood. Therefore, our aim was to elucidate the contribution of galectin-9 to trophoblast invasion.
Methods: Galectin-9 was co-immunoprecipitated from the human extravillous trophoblast cell line HTR8-SVneo to identify protein-protein interactors of galectin-9 by mass spectrometry. STRING and Ingenuity Pathway Analysis (IPA) was used to identify the components of the galectin-9 interactome. The effect of galectin-9 treatment on cell invasion and angiogenesis was evaluated using the Oris cell Invasion Assay and a protein array detecting levels of 55 angiogenesis-related proteins, respectively.
Results: We identified novel interactors of galectin-9. Galectin-9 treatment was shown to increase the invasive capacity of the trophoblast and inhibit anti-angiogenic factors, such as endoglin and endostatin. In addition, galectin-9 knockdown resulted in a reduction in invasive potential of trophoblast cells.
Conclusion: Our results provide evidence that galectin-9 promotes trophoblast invasion and regulates angiogenesis during embryo implantation. Previous research has shown an association between low galectin-9 levels and trophoblastic disease, and our new data demonstrates a potential mechanism for this correlation.

15. IFNAR1 genetic variation and resistance to HCV infection

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Introduction: Hepatitis C Virus (HCV) is a major cause of liver failure and hepatocellular carcinoma worldwide. In Ireland a homogenous cohort of women were exposed to HCV via contaminated anti-D blood products between 1977-79. This cohort can be stratified into three groups: chronic infection (CI; HCV antibody and RNA positive), spontaneous resolution (SR; HCV antibody positive, RNA negative), and exposed seronegative (ESN; HCV antibody negative, RNA negative). These ESN women likely cleared HCV using their innate immune systems. Studies have shown a SNP, rs2257167, to have a role in the clearance of HBV. Here, we hypothesise that the IFNAR1 SNP is also associated with HCV clearance in our cohort.
Methods: 368 women were genotyped for rs2257167 and statistical analysis was carried out using their HCV status and rs2257167 genotype (GG, GC or CC). MEFs were transfected with the alleles of hIFNAR1 and stimulated with IFNs to analyse differential ISG RNA expression.
Results: We approach a significant difference in allele frequency ($p = 0.069$) when comparing those who were antibody positive (CI/SR) with those who were exposed to a high-risk batch and remain seronegative. The ESN women have a greater G allele frequency correlating with an enhanced innate clearance of HCV. *In vitro* experiments demonstrated the SNP induced higher *IFNAR1* expression and resulted in differential ISG transcription.
Conclusion: It is likely that this SNP in the IFNAR1 gene influences innate anti-viral immunity through altering type I IFN signaling intensity or direction.

16. Characterising the inhibition profile of a novel antimicrobial

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Introduction: Antibiotic resistance is one of the greatest problems facing the 21st century with few new classes of antibiotics being discovered. The forefront of antibiotic discovery has been the soil microbiome and it is still a valuable resource for identifying microbes with possible antibiotic producing capabilities leading to novel classes of antibiotics. This justifies continuing investigation into the soil microbiome for antibiotic producing bacteria, to help tackle the growing trend in antibiotic

resistance. A bacterial soil isolate was found to inhibit Enterococcus faecalis ATCC 29212 and the aim of this work was to further characterise the inhibition profile of the antibacterial.
Methods: Bacterial plug and supernatant assays were used to access the inhibition ability of a soil bacterial isolate against the WHO "priority pathogens". Identification of the bacteria was carried out using 16S rRNA and whole genome sequencing. Synergy tests were carried out using broth dilution assays.
Results: The soil isolate (N5) was identified as Enterococcus and showed antibacterial activity against Staphylococcus aureus MRSA and E. faecalis VanA. This antibacterial is secreted into the supernatant which still showed inhibitory activity against MRSA and VRE. Synergy with N5 and ciprofloxacin (0.2 μg/ml) against E. faecalis ATCC 29212 was also observed.
Conclusion: Both VRE and MRSA are important players in nosocomial infections and are displaying high levels of resistance. Further study of this antibacterial could lead to the development of a new compound to help overcome resistance mechanisms or a novel antimicrobial.

17. Potentially inappropriate prescribing in community nursing units: Prevalence and potential for optimisation

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Introduction: It is well researched that individuals in long-term care (LTC) are prescribed a greater amount of medications, the leading risk factor for inappropriate prescribing. Many tools with explicit criteria are described in the literature for assessing Potentially Inappropriate Prescribing (PIP) in the general geriatric population, but few have been developed to examine prescribing in LTC.
Methods: This was a point prevalence observational study of patients aged ≥65 years residing in three HSE-run long-term care facilities in Cork. Demographic characteristics, medical diagnoses and medication regimes at time of admission (TOA) to LTC, and time of data collection were recorded and reviewed using the STOPPFrail and NORGEP-NH criteria.
Results: Of the 98 patients that met the inclusion criteria, 66% were female. The median age was 83 years (IQR 77-88 years), and median length of stay was 31 months (IQR 14-53 months). The median number of medications per person on admission was 8 (IQR 6-11), which increased to 9 (IQR 7-11) at TOR ($p<0.001$). PIP was found in 70 (84.3%) patients at TOA, and 79 (80.6%) at TOR using STOPPFrail, and was recorded in 81 patients (97.6%) at TOA, and 95 (96.9%) at TOR using NORGEP-NH. There was an increase in the number of patients prescribed psychotropic and sedative medications, while statins were prescribed less often at TOR ($p<0.001$).
Conclusion: PIP is highly prevalent in older residents of community hospitals. Criteria such as those used in this study could be used to highlight potentially inappropriate or futile medications in older, vulnerable patients.

18. A study of the prevalence of post traumatic headache in patients who have sustained a traumatic brain injury

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Introduction: There is a risk in patients who sustain a traumatic brain injury (TBI) of experiencing post traumatic headache (PTHa) as a result of their injury. This may begin in the weeks after their injury and persist chronically. The aim was to determine the prevalence of post traumatic headache (PTHa) in patients who had previously sustained a TBI, and the patient demographics associated with experiencing PTHa.
Methods: This retrospective cohort study was carried out in Cork University Hospital (CUH). Data was obtained from the medical charts of patients (n=48) from Hospital Inpatient Enquiry (HIPE). The inclusion criterion was a previous TBI.
Results: PTHa was present in 43.8%. PTHa had a greater association with higher GCS scores, with 95.24% of patients with PTHa recorded as having a GCS score of 13-15. Alcohol was implicated in 37.5% of cases of TBI, and the most common mechanism of sustaining an injury was falls, in 56.3% of cases. The mean age of patients who experienced PTHa was lower than those who did not.
Conclusion: PTHa is a common reason for a patient with TBI to re-present themselves to clinic or hospital. It may be under reported in medical charts as a diagnosis in itself. It is less prevalent than post traumatic seizures as a sequela of TBI. There is a significant implication of alcohol in the presentation of a traumatic brain injury. This is a possible issue to be addressed in future research.

19. A meta-analysis revealing re-excision identifies residual cancer as a problem - time to standardize breast surgery documentation and approach to breast cancer surgery

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Introduction: Current guidelines recommend complete cancer excision at index surgery. This meta-analysis determined the incidence of residual cancer in patients undergoing re-excision following breast conserving surgery.
Methods: An ethically approved PROSPERO-registered (CRD42018102510) meta-analysis following PRISMA guidelines using PubMed and Scopus databases for studies January 2013 to June 2018 was undertaken. Headings included "residual disease", "positive margins", "positive histology", "breast surgery", "re-excision", "reoperation". Articles scoring ≥ 18 using MINORS criteria were included.
Results: 2052 articles were reviewed with 37 used in the final analysis. Of the 9147 reoperations included, 3351/9147 (36.6% range 14-68%) contained residual cancer. Where re-excision was mastectomy, the residual cancer rate was 57% vs. 27.7% in BCS (p=0.0001 OR=4.91). Multifocality occurred in 23.5% of residual cancers. North American centres reported higher rates of residual disease than European Centres (40 to 33.2% p=0.00001 OR=1.337). 2039 /9147 reoperations were undertaken for positive margins at index surgery with a residual disease rate of 53.7% (range 29-77%). This was higher in North American vs European centres (59.8 to 49.7% p=0.000016 OR=1.501). Factors associated with residual cancer at repeat surgery were mastectomy as re-excision type, centres located in North America and positive margin at index surgery vs. any previous margin (OR=2.004).
Conclusion: This meta-analysis, confounded by inconsistent pathological definitions and reporting and exact reasons for repeat surgery, identified there were significant rates of residual breast cancer at re-excision. Known existing strategies to increase complete cancer excision at index surgery need wider implementation and monitoring. Furthermore, agreed defined international consensus on operative, surgical and pathology reporting of breast cancer surgery is urgently required.

20. Is heart rate variability (HRV) a predictor of intraventricular haemorrhage (IVH) in preterm infants?

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Introduction:
- Intraventricular haemorrhage (IVH) occurs in up to 15-20% of babies born before 32 weeks.
- Injury can cause detrimental short and long-term health outcomes.
- Heart rate variability (HRV) is a measure of autonomic function controlled by cardiorespiratory reflexes.
- Depressions and decelerations in HRV are sometimes witnessed clinically with acute central nervous system injury, such as haemorrhage.

Methods: This project analysed ECG data from 28 preterm infants (<32 weeks gestation) who have been enrolled a prospective randomised trial of umbilical cord management in CUMH.
The HRV was computed from the ECG. This was achieved by:
1) Extracting a 15-minute epoch of ECG free from major artefacts from the long-duration recordings.
2) Identifying the ECG R-peaks by visual inspection using a HRV Analysis (a UCC software package designed specifically for this task)
3) Extract quantitative HRV features from the R-R interval
4) Two time points were chosen, 6 hours and 12 hours.
The 7 HRV features were defined in 1996 by the Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology.
Results: Nine of the twenty-eight babies developed Grade 1/2 IVH. There were no statistically significant differences in the features between infants with and without low grades of IVH.

Conclusion: We found no association between HRV characteristics at 6 and 12 hours of age and low grades of IVH in preterm infants <32 weeks. Future work is needed to explore the relationship between HRV and severe IVH (Grade 3/4).

21. Shoulder pathology in recreational wheelchair athletes: comprehensive clinical assessment using a community-based, athlete-centered approach

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Introduction: Physical activity and sport participation has proven health benefits for wheelchair users and is recommended by the WHO, however, wheelchair athletes are especially vulnerable to activity-restricting injury because they employ their shoulders as principal weight-bearing joints. The aim of this study was to examine the feasibility of a protocol for shoulder examinations for wheelchair athletes in a community setting, and to identify potential modifiable risk factors for injury in this population.
Methods: Eight athletes underwent bilateral 1) 12-point ultrasonographic shoulder examination and 2) complete shoulder physical examination. They completed 3) the Wheelchair Users Shoulder Pain Index to screen for symptomatic shoulder pain 4) an environmental questionnaire to assess the accessibility of their environment, and 5) a satisfaction survey. The study was carried out in a wheelchair-friendly community fitness center.
Results: 6 of 8 participants had experienced pain in one or both shoulders over the past 2 weeks. Of the 6, all exhibited ultrasonographic findings on the painful shoulder(s). 5 of 6 had at least one physical exam finding on the painful shoulder(s). Additionally, 1 participant who self-reported no pain, had positive findings on both US and PE. Among symptomatic participants, over half reported pain when pushing their chairs over grass or carpet, the latter a surface encountered with high frequency by 7 of 8 participants. All participants were satisfied with study participation.
Conclusion: This pilot study suggests broad implementation of community-based shoulder screening may be effective at identifying both symptomatic and pre-symptomatic shoulder injury among wheelchair athletes, and that environment modification presents a prevention target.

22. Increased glycolytic metabolism in RA patients, mechanisms that may precede clinical manifestations

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Introduction: Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by synovial proliferation and degradation of articular cartilage/bone. Emerging evidence suggests that in inflammatory diseases, cells adapt their metabolic status in order to maintain activity. This study examines the inflammatory and metabolic profiles of circulatory immune-cells and synovial-tissue from patients with RA, OA, and from at-risk RA subjects (arthralgia).
Methods: Peripheral blood mononuclear-cells (PBMC) were isolated from blood of healthy controls (HC), RA, OA and at-risk individuals (arthralgia-ACPA+/RF+, normal CRP, no-synovitis). In addition, synovial-tissue was obtained from RA, OA and arthralgia patients undergoing arthroscopy. Cytokines IL-6,-IL-8 and MCP-1 mRNA expression were quantified by RT-PCR. Metabolic markers Glut-1,-LDHA,-PFKFB3,-PKM2 mRNA and/or protein expression were quantified by RT-PCR and histology.
Results: IL-6,-IL-8, the glycolytic enzyme PFKFB3 and the glucose-receptor Glut-1 were significantly increased in RA vs HC and OA (all $p<0.05$). Interestingly, a trend for increases in IL-8 and MCP-1, along with PFKFB3 and LDHA was also observed in arthralgia patients compared to OA and HC. IL-6,-IL-8 and MCP-1 were significantly higher in RA synovium vs OA, paralleled by increases in PFKFB3, Glut-1 and LDHA (all $p<0.05$). Histological expression of PFKFB3, Glut-1 and PKM2 were significantly increased in RA vs OA ($p<0.05$), expression of which were inhibited in TNFi responder compared to non-responders ($p<0.05$).
Conclusion: This study demonstrates significant increases in the metabolic profile of circulatory mononuclear-cells and synovial-tissue from patients with RA. Furthermore, the increase in inflammatory/metabolic markers in arthralgia subjects suggests that cells may already be primed pre-onset of RA.

23. Inpatient palliative medicine in an acute hospital - 12-month experience of direct admission and transfer of care

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Introduction: Inpatient palliative medicine units within acute hospitals have been shown to further improve outcomes for appropriate patients. Our aim was to review, retrospectively, the experience in one acute hospital of an inpatient palliative medicine service (IPMS), following either direct admission or transfer of care from another team.
Methods: Data was gathered retrospectively and collated from patient records for all qualifying patients. Ethical approval was received to undertake the chart review.
Results: Total number of patients n=67. Split into two groups for analysis:
Group 1. Direct admission to IPMS, n=22.

- Diagnosis - 100% cancer; Average Length of stay, n=14 days;
- Outcomes - Discharge to home, n=13 (59.1%); RIP in hospital, n=5 (22.7%); Transfer to hospice, n=3 (13.6%); Transfer to another hospital, n=1 (4.6%).

Group 2. Transfer of care to IPMS, n=45.

- Diagnosis - 41 (91%) cancer, 4 (9%) non-cancer;
- Average length of stay [total admission], n=32.6 days, average time before transfer of care to IPMS, n=19.9 days, average time under IPMS, n=12.7 days;
- Outcomes - Discharge to home, n=8 (17.8%); RIP in hospital, n=31 (68.9%); Transfer to hospice, n=2 (4.4%); Transfer to nursing home, n=3 (6.7%); Transfer to another hospital, n=1 (2.2%).

Conclusion: Inpatient palliative medicine care is feasible in an acute hospital setting. The majority of patients transferred to the IPMS from other teams were for terminal care in hospital, with a minority being medically fit to discharge home. In contrast, the majority of patients admitted directly to the IPMS were discharged home again. Patients admitted directly to the IPMS spent less time in hospital.

24. The role of the physician in the reach and adoption of online health resources: A qualitative study of the perspectives of patients and health care providers

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Introduction: Prostate cancer (PCa) patients are living longer with side effects of their treatments, which are often debilitating. Online health resources (OHRs) could provide PCa patients with the health information and support needs that they often lack. Within the RE-AIM implementation and evaluation framework, *reach* and *adoption* are often not well-defined. This work aimed to understand aspects of *reach* and *adoption* and how they interrelate through the role of the physician within the context of OHRs.
Methods: Transcripts of interviews originally collected to inform the design of an interactive website for men living with PCa, were re-analyzed using an inductive/deductive hybrid analysis.
Results: 16 patients and five health care providers (HCPs) were recruited and interviewed. Findings yielded three main categories: (1) reach, (2) patient uptake of OHRs, and (3) physician uptake of OHRs. OHRs must be straightforward and easy to use; both to increase the likelihood that a patient will use the resource and that physicians will adopt it. In general, patients considered physicians as a credible source of information. Physicians, however, did not see the referral of OHRs as their responsibility.
Conclusion: By contributing to both the *reach* and *uptake* of OHRs, physicians can increase the access to, and use of OHRs. Better alignment between hospital organizations, physicians and patient perspectives of the roles of HCPs could reconcile patient and physicians' expectations on the referral of OHRs. These findings can improve the implementation of OHRs, fulfilling the need for information that cancer survivors have, increasing their quality of life.

25. Fast acquisition abdominal MRI study for the investigation of suspected acute appendicitis in paediatric patients: Prospective, randomised assessment of the diagnostic accuracy and clinical efficacy

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Introduction: Acute appendicitis is the most common surgical diagnosis in children presenting with abdominal pain. Radiological investigations are often required to accurately identify cases of appendicitis due to varied presentations in the paediatric population. Ultrasound is currently used first line; although research is currently focused on finding alternative imaging modalities with higher diagnostic accuracy. CT is second line in many centres, however MRI has been shown to have similar sensitivity and specificity to CT, without risk of radiation exposure.
Methods: This was a prospective study carried out in CUH across a 6-month period. Inclusion criteria: patients aged 5-16 (inclusive), acute appendicitis as a differential diagnosis, requiring ultrasound assessment; as dictated by the referring clinician. Exclusion criteria: Patients with cognitive deficits, history of previous abdominal surgery. Patients provided informed consent prior to investigations. Participants underwent abdominal ultrasound and were divided into two MRI groups of sequences with free breathing, or breath holding.
Results: Results are summarised in the table below. Clinical and biochemical data were assessed ensuring no statistical difference was present between groups ($p > 0.05$)

	Sensitivity	Specificity
Ultrasound	25%	92.9%
MRI Breath hold	81.8%	66.7%
MRI Free breathing	92.3%	84.2%

Conclusion: MRI has higher diagnostic accuracy in acute appendicitis in the paediatric population than ultrasound. Allowing patients to breath freely also increases diagnostic accuracy. Introduction of MRI protocol for patients admitted with suspected appendicitis can result in faster diagnoses, and treatment. Additionally, with higher specificity, use of MRI can reduce the number of negative appendicectomies carried out in tertiary centres.

26. Healthcare service use amongst ethnic minority and immigrant groups in the UK

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Introduction: Healthcare service use by ethnic minority and immigrant groups has been shown to be less than that of the native population, this study aims to quantitatively investigate this.
Methods: Cross-sectional analysis of 24,694 UK participants from wave 7 of the UK Household Longitudinal Study (UKHLS). Outcome measures; frequency of visits to GP and hospital in the last 12 months. Logistic regression modeling was used to determine ethnic differences in healthcare use, adjusting for socio-demographics, health and length of stay in the UK. These logistic regression models were conducted for both the total and a sub population of those with poor mental health (n=4,369).
Results: Adjusting for socio-demographic, health and migration factors rendered the initial differences in healthcare use for different ethnic minority groups non-significant. In the sub population African ethnicity reached statistical significance, with reduced odds of high use of GP services (OR 0.49 [0.27-0.91]). Both self-perceived health as well as chronic health conditions, affects healthcare service use in the expected direction: the poorer the health the higher the use. Those who had been in the UK less than ten years had less use of services; only significant for hospital visits (OR 0.62 [0.39-0.98]) in the total sample. Those 41-50 years in UK saw high levels of use of GP services (OR 1.55 [1.20-2.00]).
Conclusion: Ethnicity in this study does not play as significant a role as previous research dictates. Those of African ethnicity who suffer from poor mental health seen significantly reduced odds of high use of GP services. This helps guide UK primary healthcare policy.

27. Should surgical site infection wound bundles become mandatory in colorectal surgery? A meta-analysis.

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Introduction: The global impact of surgical site infection (SSI) is increasingly recognized, both in terms of post-operative complications and oncological outcomes. Reducing SSIs is multifactorial, with a cumulative additive benefit of each bundle element. While other meta-analyses have been performed looking at surgical wound bundles most relate to interventions before 2016. This study therefore undertook an up to date meta-analysis looking at existing bundle impact on SSI.
Methods: An ethically approved PROSPERO-registered(ID:CRD42018104923) meta-analysis following PRISMA guidelines and using databases PubMed, Scopus and Web of Science, from January 2008 to July 2018, was undertaken. Articles scoring ≥ 17 using MINORS criteria were included.
Results: 5,104 articles were reviewed and 27 studies met inclusion criteria. There was a significant decrease in SSI rates with implementation of a wound bundle (17.5% vs 9.7%). Sub-analysis showed a significant reduction in superficial SSIs by 54% ($p<0.00001$) and in organ-space SSIs by 42% ($p=0.0006$). The use of a wound bundle also significantly reduced hospital lengths of stay ($MD = -0.79$; $p<0.00001$).
Conclusion: This meta-analysis shows that use of an evidence-based, surgical care wound bundle in patients undergoing colorectal surgery significantly reduces the risk of SSI and length of hospital stay. They should become mandatory.

28. An analysis of potential drug-drug interactions in an aging HIV cohort

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Introduction: The advent of antiretroviral drugs has transformed the treatment of HIV and has led to a dramatic increase in life expectancy of patients. As a result patients are more likely to acquire comorbidities which require pharmacological management. This increased pill burden is likely to lead to an increase in potential drug-drug interactions (PDDIs) between prescribed medicines.
Methods: The files of HIV patients aged 50+ (n=128) were examined to obtain demographic data and their ART regimens and co-medications. Interactions were then screened for and categorised according to severity.
Results: 72.3% (94/128) of patients took at least one co-medication with 49.2% (63/128) of patients having at least one PDDI. A total of 23 category yellow, 81 category orange and 6 category red interactions were detected. Statins and Colecalciferol were the co-medications found to contribute the most to PDDIs, leading to 19.1% and 17.3% of all PDDIs respectively. Cobicistat (29.4%) and integrase inhibitors (32.2%) were found to be the ART agents most likely to lead to a PDDI. A correlation was found to exist between the total number of PDDIs and the number of co-medications prescribed ($R= 0.621$, $p= <0.0001$) and between number of PDDIs and a decreased CD4 count ($R= -0.207$ $p=0.019$) while age and gender were found not influence on the number of PDDIs.
Conclusion: Owing to the necessity to prescribe for co-morbid conditions, it is almost inevitable that some of these medications will interact. It is therefore advisable to utilise an interaction checker database as well as clinical monitoring to optimise patient outcome.

29. Prevalence and correlates of antipsychotic polypharmacy in the treatment of schizophrenia in Cork, Ireland: A research study

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Introduction: The prevalence of antipsychotic polypharmacy in the treatment of schizophrenia is increasing worldwide. This is against most guidelines as it is associated with higher mortality and shorter patient survival, however there is little research on why multiple antipsychotics are still used. This study aimed to examine the prevalence and correlated factors of antipsychotic polypharmacy.
Methods: A retrospective chart review of current adult psychiatric inpatients with a primary diagnosis of schizophrenia or schizoaffective disorder was conducted, examining number and type of antipsychotic medications prescribed, reasons for additional prescription, side effects, symptom control, and adjunct therapy. Data was analysed in SPSS using independent t test, chi-square analysis and Fisher's exact test.
Results: The prevalence of antipsychotic polypharmacy was 77.8% (n=27). The mean age sampled was 43.9 +/- 2.2 years, with an age range of 27 – 66; There was no significant relationship between antipsychotic polypharmacy and age. 70.4% of patients were male. No significant difference was found in gender or rates of compliance, extra-pyramidal symptoms, type 2 diabetes mellitus, weight gain, other side effects, use of valproate, use of benzodiazepines, or adequate control of symptoms between those on one antipsychotic or those on polypharmacy.
Conclusion: The prevalence of antipsychotic polypharmacy observed is higher than the EU average, which may be due to the inpatient population. No significant correlates were found. These are preliminary results, and data collection is ongoing.

30. Diffusion based tractography changes of the cingulum bundle

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Introduction: The cingulum bundle of the brain is an association pathway of the limbic system which communicates with areas all over the brain. Areas of communication within the cingulum bundle are involved in spatial orientation, emotion processing, pain processing, attention, memory, autonomic function and skelomotor function. Few studies involving the cingulum have coherently determined its partitions as well as related vicissitudes throughout life's cycle. Research has instead been centred around associations and functions such as phasic pain and goal-mediated attention. Studies have shown that the cingulum bundle can be divided into subdivisions in animals based on corticocortical connections but this is yet to be shown in humans. Aim of this investigation is to use diffusion tensor imaging to separate the human cingulum bundle into subdivisions through surrounding anatomical features and to determine structural alterations of these regions during maturation into adulthood.
Methods: A total of 50 healthy (25 female) participants aged 15 – 40 years, were scanned using a High Angular Radial Diffusion Imaging (HARDI) protocol. Following constrained spherical deconvolution whole brain tractography, the cingulum bundle was reconstructed. The cingulum was divided into anatomico-functional segments (subgenual, retrosplenial, parahippocampal) by two independent raters. Cingulum dimensions and diffusion metrics (measures of structural integrity) were calculated. Ethical approval for this investigation came under the remit of the REDEEM study at Trinity College Dublin.
Results: Excellent inter-rater reliability in tract reconstruction and segmentation was demonstrated. Regional changes in diffusion metrics such as fractional anisotropy and mean diffusivity occurred with age, suggesting a global maturation of the cingulum in the mid-twenties, followed by decline. Anatomically specific variations in maturation and stability also occurred along the cingulum tract.
Conclusion: Findings suggest that the cingulum does not mature consistently throughout its structure. Different partitions evolve at different rates. Understanding the normal variation in maturation of cingulum may underlie the difficulties in emotional control that occurs during normal adolescence but may also underlie pathological abnormalities in neurodevelopmental disorders.

31. Demographic and pathologic risk factors associated with greater diabetic foot ulcer severity upon initial referral to the Cork University Hospital specialist diabetic foot clinic: A retrospective cohort analysis

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Introduction: Diabetic foot ulcers (DFU) occur in 5-10% of diabetics and are the most common precursor of amputation. Texas wound grade (TWG) classifies DFU - 0 is healed, 1 is superficial, 2 penetrates to tendon or joint capsule, and 3 penetrates to bone or joint. This study aims to characterise demographic and pathologic risk factors associated with increased TWG on initial referral to the specialist diabetic foot clinic (SDFC) at Cork University Hospital (CUH).
Methods: Data was collected from active CUH SDFC files between 2012 and 2018. Sample without specific features were excluded. Demographics included sex, age, medical coverage, residence location, marital status, employment status, referral type, and smoking. Pathologic features included HbA1c, diabetes duration, Texas wound stage (TWS), number of ulcers, hypertension, peripheral neuropathy and macrovascular, microvascular, or peripheral vascular disease. Categorical variables were compared by Chi-Squared and Fisher's exact test; continuous variables were compared by Kruskal-Wallis.
Results: Demographic differences between TWG included martial status ($p=0.011$) and referral type ($p<0.000$). TWG increased in single (TWG1=10%, 2=38%, and 3=31%) inpatients (TWG1=13%, 2=54%, 3=54%). Pathologic differences included shorter diabetes duration with TWG2 (11.9y±11.4, $p=0.029$), and TWG3 (10.3y±0.023, $p=0.026$) compared to TWG1 (16.8y±11.3). Ischaemia TWS was common with TWG1 (38%) but was infective for TWG2 (42%) and 3 (50%) ($p<0.000$).
Conclusion: Being a single and inpatient are demographic risk factors for initial referral to CUH SDFC with high-grade DFU compared to pathologic features of diabetes. The risk of infection and shorter diabetes duration suggest screening and early intervention could have could reducing initial high TWG DFU.

32. Cardiovascular risk assessment in asymptomatic patients with inflammatory arthritis

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Introduction: Cardiovascular disease (CVD) in patients with rheumatoid arthritis (RA) and other inflammatory joint disorders (IJD), is significantly increased compared to the general population. For RA, the extent of this increased risk is comparable to that reported for patients with diabetes mellitus (DM), and requires immediate and targeted cardiovascular (CV) risk management.
Methods: The SURF-RA questionnaire regarding traditional cardiovascular risks and current and past medications was distributed to all patients with a IJD attending the Rheumatology Clinic at CUH.. Traditional and rheumatoid specific CVD blood markers were assessed in this cohort of patients. Disease activity was measured using the DAS28 formula. Comparisons of patients with varying levels of disease activity with respect to their CV risk profile was examined using Mann Whitney U tests. Correlation testing was used to assess CV risk and disease activity.
Results: The analysis included 116 patients with IJD. Of which, 75 had a diagnosis of RA, 22 had a diagnosis of psoriatic arthritis (PsA), 17 had a diagnosis of ankylosing spondylitis. Disease activity was positively correlated to HbA1c level [$r = .294$, $p < 0.05$] and to QRISK3 score [$r = .252$], however this result was not statistically significant.. No significant association was found whem comparing different rheumatological treatments and with varying degrees of disease activity. Patients with IJD were found to be under-managed in terms of medicating for specific CV risk factors.
Conclusion: Patients with a higher level of disease activity had a higher cardiovascular event risk profile. Comorbidities in patients with chronic diseases including RA have been shown to be under-recognised and under-treated.This remains the case in the population examined and cardiovascular management in patients with IJD requires re-evaluation in line with EULAR recommendations.

33. A literature review on the effectiveness of prehabilitation on post-operative outcomes for anterior cruciate ligament deficient knees

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Introduction: Anterior Cruciate Ligament (ACL) injuries are a common reason for surgery. ACL-deficient knees are associated with pain, reduced quadriceps strength, neuromuscular dysfunction and poor proprioception, biomechanical mal-adaptations, and reduced knee function. An increased risk of reduced ambulatory function and osteoarthritis also exists in this population. Post-operative physiotherapy for ACL reconstruction is beneficial in the management of ACL injuries, but literature is lacking on whether pre-operative physiotherapy (prehabilitation) is beneficial.
Methods: Electronic databases EBSCO and Medline were searched, from inception to July 1, 2018. Research reports and other articles that were excluded included single case reports, duplicates, animal studies, and those articles that did not focus on prehabilitation. Additional studies were added based on preliminary readings and reviewing the references in these readings. The selected relevant articles were reviewed and the results summarized before conclusions were made.
Results: Of 47 citations identified by the search, a total of 14 studies or articles were initially eligible for this review. Upon closer inspection, only 12 studies contained post-operative results; the literature varied from clinical and narrative reviews, an editorial, and clinical cohort or randomized control studies.
Conclusion: In patients undergoing ACL reconstruction surgery, there may be beneficial effects from prehabilitation. These effects include increased quadriceps strength, improved gait, facilitating return to sport, improved patient reported outcomes, and possible decreased need for surgery. No harmful effects of prehabilitation were found; the cost-benefit ratio of prehabilitation was not discussed. Randomized control trials are needed to further establish the immediate and long-term effects of prehabilitation in patients undergoing ACL reconstruction.

34. Lamina cribrosa cell bioenergetics in glaucoma: Glycolysis and glutaminolysis

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Introduction: In glaucoma, the lamina cribrosa (LC) region undergoes considerable 3D structural changes relating to significant alterations in the extracellular matrix and associated cupping. Cells mediating this cupping include astrocytes and LC cells. We have previously shown mitochondrial dysfunction and an increased rate of proliferation in glaucomatous LC cells (GLC). Rapidly proliferating cells utilise alternative metabolic pathways to meet energy requirements. Monocarboxylate transporter 1 (MCT1) and glutaminase 2 (GLS2) are known to play an essential role in cancer cell metabolism. Glycolysis (the Warburg effect) results in high lactate levels, increasing the expression of MCT1. Glutamine uptake and metabolism is a key part of biomass accumulation in rapidly proliferating cells. The purpose of our research was to investigate the expression of markers (MCT1 and GLS2) associated with an enhanced glycolysis and glutaminolysis phenotype.
Methods: Human primary LC cells derived from normal and glaucomatous age-matched donors were cultured between passages 4-8. At confluence, cells were subject to either RNA extraction or protein isolation. MCT1 and GLS2 expression levels were quantified using quantitative real time (qRT-PCR) and western immunoblotting.
Results: The results showed that the PCR transcription level of both MCT1 and GLS2 was significantly elevated in GLC (39.14 ± 3.17 fold change in gene expression) versus normal LC cells (NLC) (31.34 ± 2. 91), ($n = 3$, $P < 0.05$) for MCT1 and (35.69 ± 3.15) versus NLC (17.63 ± 2.16) ($n = 3$, $P < 0.02$) for GLS2. This was confirmed at the protein expression level, as western immunoblotting analysis showed that the expression of both MCT1 and GLS2 was significantly elevated in GLC (9.41 ± 1.29 a.u) versus NLC (6.04 ± 1.23 a.u), ($n = 3$, $P < 0.05$) for MCT1 and (8.67 ± 1.23 a.u) versus NLC (4.95 ± .0.98 a.u) ($n = 3$, $P < 0.05$) for GLS2.
Conclusion: We found elevated expression of MCT1 and GLS2 both at transcript and protein levels, indicating enhanced glycolysis and glutaminolysis in glaucomatous LC cells. This is new evidence that glaucomatous LC cells utilise alternative metabolic pathways. Blocking these pathological pathways or facilitating physiological pathways (i.e. oxidative phosphorylation) would be a potential therapeutic in glaucoma.

35. Alcohol involvement in hospital-treated self-harm of patients under 25 years of age in Ireland from 2013-2016: A descriptive study.

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Introduction: Self-harm is common in adolescence with increasing rates in teenage years. Alcohol involvement is among factors known to be often involved in hospital-treated self-harm. It is essential to establish the role of alcohol in self-harm as well as exploring the different characteristic between presentations with and without alcohol.
Methods: Data on self-harm presentations to acute hospitals Emergency Departments in Ireland from 1 January 2013 to 31 December 2016 were analysed. The characteristic of self-harm patients presenting with and without alcohol consumption were compared. The factors associated with alcohol-involved self-harm were identified using univariate analysis and multivariate logistic regression.
Results: A total of 15415 self-harm presentations between the age of 10 to 24 years old were recorded. Alcohol was present in 3448 (22.4%) of the presentations. The major factors associated with alcohol consumption being involved is male, age 20-24 years old, having engaged in drug overdose and attempted drowning and presenting in Irish towns. Alcohol involvement were more likely to be associated with presentations made out of hours and during the weekend. Patients with alcohol on board were more likely to be brought in by ambulance and other emergency services but were less likely to be admitted under general or psychiatric admission.
Conclusion: This study highlighted the prevalence of alcohol involvement in self-harm presentation (1 in 5) under the age 25 years and identified the factors associated with presentations involving alcohol. Appropriate out-of-hours services were required to manage these presentations including ambulances, psychiatric assessments and paediatric services. The consumption of alcohol in patients <18 years old also addresses the issue of illegal age for drinking and the need for tighter alcohol control, as well as to study the consumption pattern in town areas.

36. The effect of maternal Irritable Bowel Syndrome on the risk of childhood Autism Spectrum Disorder in offspring

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Introduction: At present, there is a general consensus that multiple genes, as well as environmental influences, are involved in the development of Autism Spectrum Disorders (ASD). It has recently been suggested that one such influence may be the microbiota-gut-brain axis. Exposure of infants to altered gut microbiota through maternal presence of Irritable Bowel Syndrome (IBS) has therefore been reasoned as a possible source of aberrant fetal neurodevelopment[2] and a possible ASD risk factor.
Methods: This study involved a retrospective analysis of data extracted from the UK Millennium Cohort Study (MCS). Data on self-reported maternal IBS and relevant potential confounding variables was collected from the first MCS survey, when cohort members were 9 months old. Data on ASD was collected from survey four, when children were 7 years old. Cases used for analysis included children whose parents reported that their child had been previously diagnosed with ASD. Crude and adjusted logistic regression analysis was then conducted to assess for associations between ASD and Maternal IBS, and to control for relevant confounders, including maternal age, education level, ethnicity, BMI, smoking history, depression, depression treatment and household income.
Results: There were 13,098 singleton mother-child pairs from the first sweep of MCS data collection who also responded with regards to ASD in the fourth sweep, providing 199 ASD cases. Maternal IBS was associated with an increased risk of ASD in offspring in both crude analysis (OR 1.88 95% CI 1.20-2.95) and adjusted analysis (aOR 1.73 95% CI 1.10-2.74).
Conclusion: This study demonstrated a link between maternal IBS and ASD in offspring which warrants further investigation.

37. An audit of LLETZ procedure in a Cork City colposcopy clinic

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Introduction: Large loop excision of the transformation zone (LLETZ) is the gold standard for treatment of cervical intraepithelial neoplasia (CIN), a premalignant condition of the uterine cervix. Excision depths should not exceed 12mm to minimise future obstetric risk. Prognosis is determined by the presence or absence of CIN at the margin of conisation. The aim of this study is to audit the LLETZ procedure in St Finbarr's colposcopy clinic by assessing depth of excision and margin rates and comparing these with current guidelines.
Methods: A retrospective study of all LLETZ performed between January 2016 – March 2018. The following factors were analysed: age, indication for LLETZ, colposcopist seniority, disease severity, margin status, specimen dimensions and number of excisions.
Results: 694 LLETZ met criteria for inclusion in the study. The mean depth of excision was 8.57mm (SD: 4.4). 576 (83%) were ≤12mm. In total, there were 551 (79.4%) cases of CIN with 375 (68.1%) of these having high-grade dysplasia (CIN 3). Excisions were deeper when performed as a repeat LLETZ compared with first excision (mean 9.91mm versus 8.34mm, P = 0.001). Positive margins were found in 212 (30.5%) excisions. Deeper excisions, high grade CIN and colposcopist seniority were not found to influence margin status.
Conclusion: Compliance with current guidelines on the use of LLETZ is good. However, excision depths exceeded 12mm in a number of cases. Depth of excision was greater in repeat LLETZ. No predictive factors for margin involvement were identified.

38. Diagnostic yield of neuronal ceroid lipofuscinoses genetic testing: phenotype and genotype of neuronal ceroid lipofuscinoses

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Introduction: Neuronal ceroid lipofuscinoses (NCL) are inherited neurodegenerative disorders characterized by developmental regression, seizures, visual loss, and early death. We performed a retrospective cohort study to determine the diagnostic yield of genetic testing in NCL.
Methods: Molecular Genetics Laboratory Database was reviewed for NCL genetic tests. Electronic Patients Charts were reviewed for the patients at our Institution. Physicians from outside Institutions were contacted if they had a genetically confirmed NCL patient. Verbal phone and release of information consent forms and Research Electronic Data Capture (REDCap) questionnaires were completed. All variants were reclassified.
Results: 693 individuals underwent NCL genetic testing: 343 symptomatic, seven fetuses, and 343 family members. 84 symptomatic patients had NCL diagnosis (74 in the Molecular Genetics Laboratory Database and 10 by variant re-analysis and phenotype information): CLN1 (PPT1) (n=10), CLN2 (TPP1) (n=31), CLN3 (n=16), CLN5 (n=5), CLN6 (n=10), CLN7

(MFSD8) (n=9), and CLN8 (n=3) associated diseases. CLN2 (TPP1) associated disease was the most common NCL subtype. Phenotype of 33 patients were summarized. Juvenile onset CLN1 (PPT1) and adult onset CLN6 associated diseases were non-classical phenotypes.
Conclusion: The diagnostic yield of NCL genetic testing was 24.5%. Application of next generation sequencing will likely identify more patients with non-classical phenotypes of NCL.

39. Comparison of patient experience (PE) and health-related quality of life (HRQoL) with severe factor IX deficiency before and after switchover to extended half-life (EHL) clotting factor IX (FIX) concentrate.
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Introduction: EHL FIX prophylaxis in people with severe FIX deficiency may improve HRQoL. In 2017 an en-masse switch to rFIX Fc fusion protein (Alprolix®, SOBI) was undertaken in Ireland.
Methods: Patients with severe FIX deficiency completed switchover from standard half-life rFIX to rFIXFc (n=29). EuroQoL EQ5D5L questionnaires were completed pre and 3 months post-switchover (n=24/29). Data analysis involved descriptive statistics and EQ5D5L Crosswalk Index Calculator. On-demand factor usage for bleeding episodes was analysed 12 months pre and post-switchover.
Results: Pre-switchover, EQ5D5L dimensions "mobility" and "self-care" had the most and least problems respectively. EQVAS mean was 71, with differences seen in mean values for patients with "no problems" vs those with "at least one problem" (88 vs 69). The mean EQ5D5L Index value was 0.7.
3 months post-switchover, dimensions "mobility" and "self-care" had the most and least problems respectively. The overall EQVAS mean, mean for patients with "no problems", mean for patients with "at least one problem" and mean EQ5D5L Index value were unchanged.
No minimally clinical important difference was observed in EQ5D5L data pre and post-switchover (3 months).
However PE reports high levels of satisfaction with reduced infusion burden. The number of on-demand infusions used to resolve bleeding episodes decreased. Prior to switchover, 90.2% of bleeding episodes were resolved by 1 or 2 injections vs 97.6% post-switchover.
Conclusion: Despite the EQ5D5L data, PE suggests that HRQoL improvements have occurred post rFIXFc switchover. We aim to repeat EQ5D5L questionnaires 12 months post-switchover and complete qualitative, semi-structured interviews, focusing on HRQoL and chronic pain coping strategies.

40. Bevacizumab therapy for the treatment of adult glioblastoma: A systematic review and meta-analysis
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Introduction: Glioblastoma is the most common high-grade primary brain tumor in adults. Current treatment results in transient tumor control but inevitably cascades to disease progression. Interests in alternative therapeutic avenues demanded the exploration into anti-angiogenic therapies such as bevacizumab. We sought to determine the efficacy of bevacizumab as treatment for glioblastoma.
Methods: PubMed and Google Scholar were used to identify RCTs investigating the safety and efficacy of bevacizumab in the treatment of adult patients with both newly diagnosed and recurrent glioblastoma. Only Level I data that reported progression-free survival (PFS) and overall survival (OS) were included for analysis. Random effects meta-analyses were conducted in R^2 to estimate the hazard ratio (HR).
Results: We identified 14 studies that met criteria, reporting on 3,192 patients. Meta-analysis of HR shows the pooled OS HR [HR= 0.87, 95% CI 0.64-1.20] is insignificant, however, there is a trend for a protective effect of bevacizumab on OS. The pooled estimate of PFS HR suggests that bevacizumab treatment is associated with 35% decreased risk of disease progression

[HR 0.65, 95% CI 0.55-0.77; p < 0.001]. A pooled estimate of OS months of -0.01 months suggests minor differences in time of survival between treatment groups (95% CI 30-1.27 months). The pooled estimate for difference in PFS was 2.30 months (95% CI 1.36-3.24; p<0.001) suggesting those on bevacizumab had two additional months of PFS.
Conclusion: Bevacizumab therapy is associated with a longer PFS in adult patients with glioblastoma but had an inconsistent effect on OS in this patient population.

41. Adherence to intertemporal discounting guidelines in cost-effectiveness analysis: A research study
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Introduction: Cost-effectiveness analysis (CEA) is used by healthcare decision makers to guide decisions on the prioritisation of funding medical interventions. Discounting is applied to account for time preference when calculating the value of costs and health consequences in the future. This paper analyses adherence to discounting rates by published papers in selected countries with established CEA guidelines.
Methods: The Tufts Medical Centre CEA Registry was interrogated to collect data on discounting rates used in CEA in seven countries. Factors associated with non-compliance to guidelines were analysed by binary logistic regression.
Results: The percentage of adherent studies ranged from 44% to 93% between the countries. There was a sharp contrast in the rates of neighbouring countries Australia and New Zealand, whose rates were 79% and 44%, respectively. The Netherlands' adherence rate was 79% while using equal discounting, rising to 91% when differential discounting was adopted in 2006. Belgium had an adherence rate of 93%. When studies were analysed by publication year, there was a steady increase in adherent studies over time.

Study Country	Adherent studies		Total number of studies
	Number	Percentage (%)	
UK	**297**	**81**	**365**
1999-2003	8	30	27
2004-2017	289	86	338
Ireland	**13**	**76**	**17**
Canada	**206**	**67**	**308**
Australia	**96**	**79**	**121**
New Zealand	**11**	**44**	**25**
The Netherlands	**193**	**88**	**219**
1999-2005	23	72	32
2006-2017	170	91	187
Belgium	**42**	**93**	**45**
Total	**828**	**78**	**1100**

Conclusion: This paper highlights that there is scope for improvement in adherence to official CEA guidelines. Type of funding, country of study, and year of publication were found to be statistically significant variables. An overall improvement in adherence rates was observed over time. Geographical proximity is not correlated with similar adherence rates. Increased adherence rates were linked to studies funded by pharmaceutical manufacturers over non-manufacturers. Better adherence was correlated to countries applying differential discounting.

42. The development of a neuroendocrine tumour database for improved patient care

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Introduction: Neuroendocrine tumours (NETs) are epithelial neoplasms with predominant neuroendocrine differentiation and can arise in most organs of the body, most commonly the gastrointestinal tract. They are rare with an incidence of 0.2-2.5 cases per 100,000 population and account for 0.5% of all cancers. NETs are classified based on grade and differentiation, clinical syndrome or tumour site of origin. The goal of this project was to integrate international guidelines into a novel online NET patient database to ensure accurate audit and assessment of patients with NETs to ensure optimal management.
Methods: Areas of interest were identified using international guidelines. Template fields for each area of interest were created using Microsoft Excel. The online database was created by an IT programmer using the template. The database was populated using the hospital patient correspondence system. Current practice in University Hospital Galway was compared with international guidelines.
Results: 43 Neuroendocrine tumours were identified, of which seventeen (42%) were pheochromocytoma paragangliomas, seven(16%) were pancreatic, seven(16%) midgut, five(12%) gastric, three(7%) thoracic, three(5%) hindgut and one(2%) renal. Mean age at diagnosis was 50.1 years and 60% of patients (n=26) were female.
Conclusion: The database will continue to be updated in real time in endocrinology outpatient clinics. We will continue to audit management of our practice in University Hospital Galway in comparison to international guidelines. We plan to collaborate with other centres nationally, to gather data for an entire cohort of Irish patients with neuroendocrine tumours which will allow the follow-up of NETs patients to be streamlined nationally.

43. A multidisciplinary approach to clinical supervision: Charter of best practice in medicine, dentistry, and pharmacy

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Introduction: Clinical Supervision is integral to training of healthcare professionals. The Irish Medical Council guidelines outline "A Doctors' Duty to Educate". Other healthcare professionals' roles in education are not clearly defined by their respective governing bodies. The aim of this project is to improve student experience of clinical supervision, thus ensuring competent, confident, healthcare professionals upon graduation. The objective of this project was to gain knowledge of the student experience in a number of different healthcare disciplines.
Methods: Representatives from University College Cork Schools of Medicine, Dentistry and Pharmacy convened to share multidisciplinary student perspectives. Each school then presented the student experience of clinical supervision outlining both positive and negative aspects and acknowledging inherent challenges faced. Key points were discussed and common themes were identified. Using the Model United Nations Resolutions, a Charter of Best Practice was produced to provide a framework for an ideal form of clinical supervision.
Results: All schools recognised the importance of Clinical Placement to gain exposure, experience, and develop skills. The Charter focuses on three key areas: the responsibility of the School, the responsibility of the Supervisor, and the responsibility of the Student.
Conclusion: The Charter wishes to open dialogue around the area of clinical supervision and inform strategies for best practice. It is intended that universities will engage with and implement this Charter of Best Practice in order to achieve an ideal model of clinical supervision. This Charter intends to further empower the student community to deliver high quality healthcare in the future.

44. Parental knowledge of physical activity guidelines and levels of physical activity in children

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Introduction: Childhood obesity is a risk factor for developing metabolic syndromes, with these patients five times as likely to develop type 2 diabetes compared to those without metabolic syndromes. Significant contributors to obesity include decreased physical activity, poor diet, and sedentary behaviours, especially television viewing. Current guidelines recommend no more than 2-hours non-educational screen-time per day.
Aims: Examining parental knowledge regarding exercise guidelines, the portrayal of exercise on television and to ascertain self-reporting of physical activity and any relevant barriers.
Methods: Cross-sectional survey on parents of children aged 4-16 years old, presenting to University Hospital Limerick, October-April, 2018. Surveys regarding television viewing and perceptions of television portrayal of exercise. Data analysed on SPSS.
Results: Sixty parents completed the surveys and the majority of were aware that 60 minutes is the recommended guideline (50%), despite a wide answer range (20-240min). Most parents believed dancing was the most common exercise depicted on television (40%). 60% of children met activity guidelines during weekdays, with this increasing to 75% at weekends. Two-thirds of parents surveyed were not concerned regarding their child's activity levels. Commonly reported barriers to exercise were time involved and cost.
Conclusion: Results showed parents were aware of physical activity guidelines and of exercise portrayal on television. Self-reporting indicated two-thirds of children were meeting minimum recommended activity guidelines during the week. Results show that despite parental knowledge regarding guidelines, many children do not meet recommendations, which is associated with increased sedentary television viewing. Future work in this area should fully explore mechanisms underpinning reduced activity and relevant interventions.

45. IceBand® knee brace towards rapid rehabilitation in post operative total knee replacement: A prospective trial

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Introduction: Patients with total knee replacement (TKR) experience warmth, swelling post-operation that spans 6-12 weeks[1]. This study aims to compare two knee cooling compression braces; the Ice Band (IB) and the Cryo-Cuff (CC). The disposable IB brace uses water and phase changing elements which induces analgesia for 60min and can be reused 30 times. Contrasting, CC requires external water input every 20min and requires thorough cleaning for reuse[2].
Methods: Twelve Patients (11 TKR and 1 aspiration for haemarthrosis) tried on both IB and CC post-op and were asked to rate the compliance and effectiveness of analgesia on an ordinal score of 0-10 (0=poor and 10=excellent). Parameters included were ease of application, convenience, mobility and pain relief. A paired sample T-test was used to compare mean differences within above parameters.
Results: The ease of application of the IB was rated higher than CC with a mean score of 3.69 ± 2.98 [95% CI: 1.89 to 5.50, $p < 0.001$]. IB system was reported to be more secure than CC with a mean score of 3.15 ± 2.34 [95% CI: 1.74 to 4.57, $p < 0.0001$]. Compliance of IB was higher than that of CC by 2.53 ± 1.94 [95% CI: 1.37 to 3.71, $p < 0.001$]. The most pertinent findings of this study indicated that the pain alleviation by IB was rated higher than CC by 3.23 ± 1.88 [95% CI: 2.10 to 4.40, $p < 0.0001$].
Conclusion: These results culminate into the noticeable preference amongst the patients for usage of IB over CC.

46. Decrypting the amygdala: Interpreting neuroanatomical changes in depression

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Introduction: The amygdala is a key structure involved in emotional processing. Amygdala volume changes have been observed in depression, however previous studies have been inconclusive. This may be due to changes in depression occurring at a subnuclear level, rather than in the volume of the whole amygdala.
Methods: MRI scans were compared between 80 secondary care patients meeting diagnostic criteria for major depressive disorder and 83 healthy controls. High resolution T1 and T2-FLAIR weighted MRI brain scans were examined using the automated amygdalar substructure volumetric module in Freesurfer version 6.0. Between-group volumetric assessment of nuclei was performed. Ethics approval was granted by the St James/Tallaght joint REC.
Results: Nine nuclei were identified in each amygdala hemisphere. These were divided into three composite groups, based on functional, hodological and embryological similarities. We found that the output centromedial group of nuclei was larger on the right side in depression. We also found that the left-right asymmetry of the whole amygdala was increased in depression (with the left amygdala slightly decreasing and the right amygdala slightly increasing). This asymmetry was driven by differences in centromedial nuclei.
Conclusion: This study identified the right sided centromedial nuclei as important in depression. These nuclei send amygdala output directly to the hypothalamus, allowing the amygdala to influence emotional states through autonomic and HPA axis changes. Both changes are known to occur in depression and can manifest as anxiety, stress, agitation and vegetative disturbance. This study shows how neuroanatomical expertise may lead to improved interpretation of clinical research.

47. A meta-analysis of re-admission following emergency general surgery - Time to take action

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Introduction: Emergency General Surgery poses one of the great challenges in surgical outcomes; currently accounting for up to 10% of hospital admissions and has a mortality of between 5% and 30%. The pattern of re-admission to hospital following laparotomy is not well defined. This study undertook a meta-analysis to determine patterns of re-admission post emergency laparotomy.
Methods: An ethically PROSPERO registered meta-analysis searching PubMed and Scopus electronic databases from January 2013 to June 2018 adhered to PRISMA guidelines was undertaken. Publications potentially suitable were graded using Methodological Index for Non-Randomised Studies; papers scoring >=18/24 were included for data analysis. The primary outcome of interest was unplanned readmission with 30 days of patients post index emergency laparotomy.
Results: The scientific review identified 1,130 articles. 42 were found to be potentially suitable, and 14 of these were included after applying MINORS score cut off. The final cohort included 18,075 patients from seven countries. Five papers came from the USA, four papers came from the UK and the remainder came from Italy, Thailand, Switzerland, Sweden and India. The overall mean rate of readmission was 9.3% with 1,680 readmissions from 18,075 emergency laparotomies performed, the range of re-admission in included studies varied from 0%-34%.
When sorting publications' readmission rates by mid-year value (of studies' observation years) there appears to be a shallow downwards trend over time.
Conclusion: Lack of available data on confounding factors made subgroup analysis impossible as readmission was a tertiary outcome in included papers.

48. Dual-extrusion 3D printing of glenohumeral joint for education purpose

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Introduction: To date there have been limited publications exploring the potential role of 3D printing in anatomy education. 3D-printed copies based on high-resolution MRI scanning data have the advantage of higher accuracy, better reproducibility, increased cost effectiveness and reduced constraints to plastinated specimens.
Methods: FilaFlex^{3D} flexible filament and polylactic acid (PLA) filament were chosen to represent muscle and bone respectively. These materials were printed by a BigBuilder printer with a single nozzle of 0.4mm. The printed PLA showed an average of 1.2% error across X, Y, and Z directions while the errors in all directions for FilaFlex^{3D} were statistically greater (average 3.2%) MRI scans of the wanted files were obtained from online resources and modified by modeling software.
Results: The focus was to show the movements of rotator cuff muscles. A single print model of the shoulder joint consisting of hard and flexible structures with limited movements of abduction and adduction was constructed. Anterior and posterior dislocations of the shoulder joint were able to be exhibited.
Conclusion: With increasing popularity and accessibility, 3D printing of different body parts should be offered in medical libraries to allow students to learn anatomy in a more effective way with this emerging technology.

49. Discrepancy between the one-stage FVIII clotting assay and the chromogenic FVIII assay: A study of the Cork population of mild and moderate FVIII deficient patients

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Introduction: FVIII assays measure a person's FVIII activity level and allow diagnosis and classification of FVIII deficiency. The one-stage FVIII clotting assay (FVIII:C) and the chromogenic FVIII assay (FVIII:Chr) are most commonly used. In 30% of mild FVIII deficient patients, the results of these two FVIII assays on the same sample will differ. This FVIII assay discrepancy is associated with certain variants within the F8 gene.
Methods: A review of patient charts and analysis of the Clintech and Apex systems at CCC was performed. All mild and moderate FVIII deficient patients were included. For each patient a baseline result of FVIII:C and FVIII:Chr were recorded as well as each patient's F8 variant. Each variant found was searched in the 'F8 Gene Variant Database' for any reported association with a FVIII assay discrepancy.
Results: 14 of the 44 patients (31.8%) who had both FVIII assays performed had a FVIII assay discrepancy. 7 patients would have been misdiagnosed or misclassified using only FVIII:C. Failed diagnosis would have occurred once using FVIII:Chr alone. One patient had an unknown variant. This patient had a FVIII assay discrepancy.2 patients with a discrepancy have a common variant not known to be associated with FVIII assay discrepancy. 23 other mild FVIII deficiency patients without a discrepancy possessed this variant.
Conclusion: FVIII assay discrepancy incidence was consistent with European incidences. To ensure correct diagnosis, both FVIII assays should be used in FVIII deficiency testing. The *F8* gene variation is a significant factor in a multifactorial cause of FVIII assay discrepancy.

50. Aberrant activation of the PI3K/mTOR pathway promotes resistance to sorafenib in AML

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Introduction: Therapy directed against oncogenic FLT3 has been shown to induce response in patients with acute myeloid leukemia (AML), but these responses are almost always transient. To address the mechanism of FLT3 inhibitor resistance, we generated two resistant AML cell lines by sustained treatment with the FLT3 inhibitor sorafenib. Parental cell lines carry the FLT3-ITD (tandem duplication) mutation and are highly responsive to FLT3 inhibitors, whereas resistant cell lines display resistance to multiple FLT3 inhibitors.
Methods: Sanger Sequencing, protein mass-spectrometry, cell culture, immunoprecipitation, western blott, microarrays, mouse models, flow cytometry.
Results: Sanger sequencing and protein mass-spectrometry did not identify any acquired mutations in FLT3 in the resistant cells. Moreover, sorafenib treatment effectively blocked FLT3 activation in resistant cells, whereas it was unable to block colony formation or cell survival, suggesting that the resistant cells are no longer FLT3 dependent. Gene expression analysis of sensitive and resistant cell lines, as well as of blasts from patients with sorafenib-resistant AML, suggested an enrichment of the PI3K/mTOR pathway in the resistant phenotype, which was further supported by next-generation sequencing and phospho-specific-antibody array analysis.
Furthermore, a selective PI3K/mTOR inhibitor, gedatolisib, efficiently blocked proliferation, colony and tumor formation, and induced apoptosis in resistant cell lines. Gedatolisib significantly extended survival of mice in a sorafenib-resistant AML patient- derived xenograft model.
Conclusion: Taken together, our data suggest that aberrant activation of the PI3K/mTOR pathway in FLT3-ITD-dependent AML results in resistance to drugs targeting FLT3.

51. Understanding the natural history of common bile duct stones: a meta-analysis and systematic review

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Introduction: Biliary disease is a leading cause for surgical emergency admissions globally and despite the association of common bile duct (CBD) stones with increased mortality, the natural history of CBD stones is not well documented. This study undertook a meta- analysis of the significance of CBD stones in cholecystectomy patients.
Methods: An ethically approved, PROSPERO-registered (CRD42018102167) meta-analysis following the PRISMA guidelines was undertaken. The databases PubMed and Scopus were searched for relevant literature from the last thirty years. Articles were assessed using the Methodological Index for Non-Randomised Studies (MINORS). MINORS scores for included articles were $\geq$ 10/16 (non-comparative studies) and $\geq$ 15/24 (comparative studies). The primary outcome was the natural history of CBD stones.

Results: This study identified 11215 articles. 43 were found to meet the inclusion criteria and 28 of these were included for analysis after applying the MINORS criteria. A total of 46588 cholecystectomies were reported, with CBD stones identified in 4955 patients (10.6%) (Range: 1.3%-20.9%). Post cholecystectomy, CBD stones passed spontaneously in 49.6%(mean) of patients (Range: 12.5% - 73%) . Only four papers reported the clinical sequalae of CBD stones: the rate of pancreatitis, jaundice, cholangitis, and abdominal pain in cholecystectomy patients were 11.8%, 45.3%, 8.2% and 43.8% respectively.
Conclusion: Remarkably, few papers report known outcomes of CBD stones in patients undergoing cholecystectomy. Complications are significant in 8-45% of patients. With decreasing cholangiography rates, this may result in increased long term biliary related mortality. Multinational risk registries are urgently required to identify the sequalae in CBD stones.

52. Long term impacts of common mental illness on employment for ethnic minorities in the UK

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Introduction: In the UK, 80 million working days are lost every year due to mental illnesses, costing employers £1-2 billion each year. It is estimated that a quarter of the adults in the UK may be experiencing a mental health problem (McManus, 2009). People from some migrant and ethnic minority communities tend to have poorer mental health, compared to their British White counterparts.
Methods: This is a quantitative, prospective cohort study using data from Understanding Society UK, examining the relationship between mental illness and employment outcomes across ethnic groups, compared to the British white population. The effect of psychological distress at Wave 1 (2008-2010) on employment at Wave 7 (2013-2015) will be tested along with all the factors at Wave 1 that may affect employment.
Results: The study found that there were no significant differences between ethnic minorities and the White British population for mental health or employment outcomes. The main predictors of being psychologically distressed were being of an older age group, male gender, being married and having lived in the UK less than ten years. After looking at employment change between 2008 and 2015, females were almost 40% less likely to become unemployed compared to males. Those who were psychologically distressed had a 60% greater chance of becoming unemployed.
Conclusion: The study shows mental illness can impact people in the long term, with a negative effect on employment. There are many areas a person can be supported to improve their mental health to eliminate any long-term effects that it may cause.

53. An analysis of the impact of employment history on stress, burnout and resilience among medical interns in Ireland

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Introduction: As medical students graduate and become doctors they assume new roles as employees with a large array of new responsibilities and stressors. The ability of an individual to cope with stressors may be assessed by their perceived stress, burnout and resilience. This study hypothesised that the pattern and sector of employment prior to internship may have an impact on stress, burnout and resilience scores.
Methods: A cross-sectional analysis was conducted on interns at two Irish hospitals using an online survey which incorporated questions to determine demographics, employment history, a Likert-type scale and three validated scoring tools – the Perceived Stress Scale (PSS), the Oldenburg Burnout Inventory (OLBI) and the Connor-Davidson Resilience Scale (CD-RISC).
Results: The response rate was 32.3% (n=31). Demographics and employment history were described using counts and percentages. Tbe Likert-type scale indicated that interns find their job stressful and stimulating. A majority (80.65%, n=25) felt that their previous work experience had helped them in their role. Those who worked during medical school were found to be more resilient than those who did not (Fisher's exact test, p=0.019).
Conclusion: Those who work during their medical education may exhibit greater levels of resilience (p=0.019). With 80.65% of interns indicating that their previous jobs helped them in their work as interns, it is worth finding out what aspect of their work had this effect. This study suggests further surveys alongside qualitative research to further determine the relationship between employment history and resilience and utilise this information to augment medical training.

Table 1: Likert-type scale statements and associated percentage and count of respondents who agreed with each

Likert-type scale statements	% of participants who chose "Agree" or "Strongly agree"	Number
"I feel that my previous work experience has helped me in my work as an intern"	80.65	25
"I feel that I have been treated more poorly as an intern than in my previous jobs"	67.74	21
"My work as an intern has been more stimulating than any job I have had previously"	80.65	25
"My work as an intern has been more stressful than any job I have had previously"	83.87	26
"My medical degree prepared me adequately for the transition from student to intern doctor"	32.26	10
"I wish that I could have had more practical work experience in my training prior to becoming an intern doctor"	74.19	23
"I prefer my job as an intern doctor to any job I have had previously"	74.19	23

54. Readmission to hospital following laparoscopic cholecystectomy: A meta-analysis

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Introduction: Laparoscopic cholecystectomy is one of the most commonly performed surgical procedures. Despite this, the pattern of readmission to hospital following laparoscopic cholecystectomy is not well defined. This meta-analysis aimed to determine rates and predictors of readmission.
Methods: An ethically approved PROSPERO-registered meta-analysis was undertaken searching PubMed, Scopus, Web of Science and Cochrane Library databases from January 2013-June 2018 and followed the PRISMA flow diagram format. Published literature potentially suitable for data analysis was graded using methodological index for non-randomised studies (MINORS) criteria; papers scoring ≥ 16/24 were included. The odds ratio (OR) using random-effects, Mantel-Haenszel method with 95% confidence intervals (CI) were computed for each potential risk factors using RevMan5.
Results: 3,632 articles were reduced to 44 studies qualifying for a final analysis of 1,573,715 laparoscopic cholecystectomies from 25 countries. Overall readmission rate was 3.3% (range: 0.0%-11.7%); 52,628 readmissions out of 1,573,715 laparoscopic cholecystectomies performed. Surgical complications accounted for 76% of reported reasons for readmission, predominantly bile duct complications (33%), wound infection (17%) and nausea and vomiting (9%). Pain (15%) and cardiorespiratory complications (8%) account for the remainder. Obesity, single port laparoscopic cholecystectomy and day case laparoscopic cholecystectomy did not increase rates of readmission.
Conclusion: Surgical complications are the most common causes for readmission, however causes are inconsistently reported. No statistically significant risk factors were identified. The mean readmission rate of 3.3% may act as a quality benchmark for improving laparoscopic cholecystectomies and clearer reporting of reasons for readmission may aid in their reduction.

55. Buddy operating within gynaecological oncology: a retrospective review of hysterectomies and associated outcomes

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Introduction: Gynaecological laparoscopic surgery has evolved substantially in the last number of decades from its use in minimal diagnostic procedures to major operations. The Belfast Trust team of consultants decided to launch an initiative of 'Buddy Operating'- a surgical procedure involving two or more consultant specialists- with the aim to demonstrate that Buddy Operating will have a positive impact on patient outcomes, specifically a reduction in cases involving major surgery; shorter post-operative length of stays and a reduction in intra-operative blood loss.
Methods: The review compares all hysterectomy operations on malignancies carried out by at least one gynaecological oncologist between 2004, 2014 and 2017, with data being sourced via patient electronic care record and theatre ledger. Results

recorded include intra-operative outcomes encompassing date of operation, post-operative length of stay, post-operative blood loss and nature of hysterectomy. Additional intra-operative procedures were also recorded.
Results: Between 2004 to 2017, buddy operations rose from 21.3% to 50% of all operations performed (135% increase) and mean Hb loss dropped from 18.2-17.8g/L (ARR 2%) and from 22.7-13.3g/L (ARR 41%) for open and laparoscopic procedures respectively. Mean LOS reduced from 13.43 days to 5.31 days (155% reduction).
Conclusion: The move towards laparoscopic procedures has resulted in reduced hospital stay and blood loss. This alongside the continued efforts of the BCH gynaecological oncologists to implement the technique of buddy operating has shown synergistic effect on such outcomes. Buddy operating has helped to facilitate this paradigm shift towards laparoscopy and improved its efficacy to become established as the preferred technique in Belfast.

56. A systematic review to assess the effectiveness of technology-based interventions to address obesity in children

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Introduction: Childhood obesity is associated with a multitude of co-morbidities, including hypertension, hyperlipidaemia, cardiovascular disease and type 2 diabetes. Given the prevalence of overweight and obese children globally, it is imperative that effective interventions are developed. Children are receptive to information conveyed via digital means, therefore, the use of technology plays a crucial role.
Methods: A search strategy was undertaken in Medline and Embase, covering publications up to and including 12th July 2018. Randomised controlled trials assessing the effectiveness of technology-based interventions, as secondary prevention, on weight-related outcomes in children, aged 8 to 18, published only in the English language, were included. From an initial search total of 1,012 studies, 11 met the inclusion criteria. They were assessed for methodological quality using the Cochrane Risk of Bias Tool and were analysed using a narrative approach.
Results: The findings of this review showed a weak evidence base regarding the role of technology-based interventions, employed as secondary prevention, to address childhood obesity. Of the eleven studies reviewed, three (27%) showed a positive relationship between technology-based interventions and weight-related outcomes in overweight or obese children.
Conclusion: Technology-based interventions, primarily active video games, as well as internet or web-based interventions and mobile phone communications, may have a positive impact on weight-related outcomes. It is difficult to determine the degree of efficacy of these technology-based interventions, as there is a lack of high quality evidence from which to draw trustworthy conclusions. The review highlights the potential of such interventions and the need for further investigation.

57. Impact of the obesity epidemic on demand and provision for hip and knee surgery in Ireland

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Introduction: The obesity epidemic is evolving in every age group worldwide. Levels of obesity directly correlate with osteoarthritis, the leading cause for hip and knee replacements. Little is known about the future demand for hip and knee surgery and in particular the impact of obesity on service providers of these procedures in Ireland.
Methods: We obtained hospital inpatient equiry (HIPE) data on hip and knee replacement surgery provided in public hospitals for the period 2010-2017, and estimated sex and age stratified surgery rates. We obtained overweight and obesity data from national population health surveys, and modelled their development over time by sex and age.
Through literature research, relative risk rates were obtained for osteoarthritis and hip and knee replacements for different weight categories. We describe the proportion of surgery related to overweight and obsesity in the historical data. By extrapolating the stratified obesity rates, we are able to predict the future prevalance of overweight and obesity levels; we can then project the future demand until 2030 using these levels and population projections.
Results: During the period 2010-2017, 20,662 hip and 12,800 knee replacements were performed in public hospitals. We observed a continous growth in sex and age related procedure rates indicating a higher demand for replacement surgery. We use the principles of attributable fractions to describe the proportion of replacement surgery related to weight.
Conclusion: This study indicates that anticipated growth in obesity rates present a major challenge for the provision of orthopaedic services.

58. The functional effects of circular RNA HNF4a in colorectal cancer cells

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Circular RNAs (circRNA) are a re-emerging type of non-coding RNA formed by covalent circularisation of pre-mRNA. It has been reported that cell lines and tissues from colorectal cancer (CRC), the third most commonly diagnosed cancer, show a global reduction in circRNA compared to normal colon mucosa. The hepatocyte nuclear factor 4-a (HNF4A) gene has also been linked to the progression of CRC and appear to regulate chemoresistance towards the FOLFOX regimen. Therefore, we postulate that the circular RNA version of the HNF4A gene may also play a role in CRC pathogenesis, particularly drug resistance. The objectives of this research were to (a) investigate the expression of circHNF4A in CRC cell line HCT116 and (b) investigate its effects on drug sensitivity to 5-Fluorouracil (5-FU) and Oxaliplatin.
HCT116 was cultured and a secondary FOLFOX-resistant variant was induced through regular treatment with 5FU combined with oxaliplatin. Samples of each were transfected with circHNF4A siRNA to reduce its expression, then qPCR carried out to measure levels of circHNF4A in both non-transfected and transfected cells. Cell viability was assessed using the XTT assay, prepared with descending concentrations of 5FU and oxaliplatin.
CircHNF4A expression was found to be low in parental cells and attenuated in the resistant counterpart. No circHNF4A readings were detected when siRNA-transfected, though sensitivity to both drugs slightly increased.
circHNF4A may thus play a role in increasing CRC resistance to 5-FU and oxaliplatin, however, may not be a causative factor. Further optimisation and repeats are needed to confirm this conclusion.

59. Diagnosing colon cancer using CT colonography and neural networks

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Introduction: Globally, colon cancer is the third most common cancer and is among the most deadly. In the United States, colon cancer is among the most common cancers, causing over 130,000 new cases and over 50,000 deaths annually. When diagnosed in early stages, it is curable with a 92% survival rate. Thus, early detection of colon cancer polyps can enhance the long-term survival outcomes of patients.
Methods: Colonography, also known as virtual colonoscopy, is a detection method that involves CT scans to view the intestine internally and visualize polyps. In this research, to enhance the diagnostic accuracy of colon cancer using colonography, an artificial intelligence approach using neural network algorithms was used to analyze 794 images of clinical patient data and develop the computational model. For the training process, a random selection of 50% of the dataset was utilized, and the remainder 50% was used as the testing dataset to diagnose colon cancer.
Results: Diagnosing colon cancer in patients, the developed neural network model achieved 87.78% accuracy based on the training dataset and 84.59% accuracy based on the testing dataset.
Conclusion: Thus, the neural network models can be used in conjunction with CT colonography to help healthcare professionals with early detection and diagnostic accuracy of colon cancer in patients.

60. Skin cancer diagnosis and prognosis using deep machine learning

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Introduction: According to the World Health Organization, skin cancer is the most common kind of cancer, affecting over 3 million annually. Melanoma, a malignant skin cancer, causes more than 75% of skin cancer deaths. When detected at early stages, patients with melanoma have a five-year survival rate of 99%. Thus, early detection and diagnosis of melanoma is important for improving patient outcomes.
Methods: Visually, melanoma can be difficult to distinguish from non-cancer skin lesions due to similarity in appearances. In this research, a computational model built using deep machine learning and clinical patient data is used to help healthcare professionals in early detection of skin cancers as well as enhancing consistency and diagnostic accuracy of melanoma from benign skin lesions. Clinical data, including 1,938 patients [364 melanoma, 1574 benign] from medical institutions, was used

to build, train, and test the computational model. To train the model, 50% of the data was randomly selected and utilized while the remaining 50% of patient data was utilized for testing the melanoma prediction capabilities of the model.
Results: In diagnosing skin cancer in patients, the machine learning model equipped with neural network algorithms was able to achieve an overall accuracy of 90.2% among the training group and 85.6% among the testing group performance results with the novel clinical patient data.
Conclusion: Thus, models based on machine learning algorithms may be used to aid medical professionals for enhancing early detection and accuracy of skin cancer diagnoses in patients.

61. Using ultraviolet C light as a treatment method for pro-inflammatory cells in a perfusion system

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Introduction: Lung transplantation is a successful therapy for end-stage lung diseases. *Ex vivo* lung perfusion (EVLP) has increased organ utilization, expanding the donor pool. The Toronto EVLP technique uses a leucocyte filter as a scavenger, however it may not be effective throughout the entire treatment. Ultraviolet C (UVC) light has been shown to induce apoptosis in human lymphoid cells and is a realistic approach for leucocyte reduction in EVLP.
Methods: Two mini-EVLPs were primed with perfusate from clinical EVLPs, and divided in two groups (n=5, each, for 3h): 1. UVC, 2. Control (no light). EVLP perfusate samples were also collected from standard and UVC-irradiated human EVLPs (n=3, each, for 5h). UVC was delivered with custom UVC illumination devices. Samples from both circuit types were taken at different time points and analysed using flow cytometry for cell population assessments, and ELISA to detect perfusate cytokines.
Results: UVC-irradiated circuits had increased late apoptotic cells (233±73 vs. 111±7%) and decreased total live cells (71±16 vs. 98±12%) and neutrophils (45±26 vs. 138±73%). ELISA analysis showed reduction of IL-1β, IL-6 and IL-8 over time in the UVC-irradiated circuits compared to control (IL-1β= 37±33 vs. 50±27%, IL-6= 88±8 vs.101±3%, IL-8= 84±12 vs. 108±19%).
Conclusion: This study depicts UVC as an effective approach to treat pro-inflammatory cells in a perfusion system, leading to cytokine decrease. This suggests that UVC light may offer a substitute to the traditional leucocyte filter during EVLP, potentially leading to better lung transplantation outcomes.

62. A clinical audit of xerostomia assessment and treatment practices amongst advanced cancer patients in a palliative care setting

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Introduction: Xerostomia is the subjective sensation of dry mouth. It is the fourth most common symptom in advanced cancer patients and impacts negatively on physical and psychosocial wellbeing. Older age and polypharmacy are risk factors for dry mouth and are common in advanced disease. This study aims to evaluate prevalence of xerostomia, as well as compliance with assessment and treatment practices.
Methods: A retrospective chart audit was conducted on 173 admissions from an in-patient palliative care unit. Data were collected pertaining to patient demographics, cancer diagnosis, medications, oral health assessment and xerostomia treatment. Audit standards were based on local policy as follows: Oral Health Assessment Tool (OHAT) completed on all patients; OHAT completed within one day of admission; oral care plan completed if problem diagnosed; xerostomia treatment prescribed where necessary. Descriptive statistics were used to report compliance with standards. Cohen's Kappa and Intraclass Correlation Coefficient were used for inter-rater reliability based on a 10% sample of the dataset.
Results: 86% of admissions had OHAT completed and 91% of these were on day of admission. Care plans were completed for 76% of patients with oral care needs. Appropriate medications were prescribed for 34% of patients with dry mouth. Inter-rater reliability was high or perfect for all primary outcomes.

Conclusion: Results indicate that oral health is evaluated in the majority of patients, however treatment appears low. This may be due to poor instrument design, where non-prescription treatments or 'treatment unnecessary' cannot be documented. Existing policy tools were amended to reflect patient care needs more accurately.

63. Inflammasome product IL-1β increases oligodendroglial lineage cell number and promotes their differentiation

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Introduction: The inflammasome is a multimeric protein complex that initiates immune responses to danger signals by releasing the cytokines interleukin-1β (IL-1β) and IL-18. Inflammasomes are thought to be involved in multiple sclerosis (MS), an immune-mediated, demyelinating disorder. Some studies have shown that inflammasome activity can promote CNS repair. We hypothesised that inflammasomes can be stimulated in CNS cells, and that inflammasome activity promotes oligodendrocyte progenitor cell (OPC) proliferation and/or differentiation.
Methods: Mixed glial cultures were generated from wild-type (WT) and *Il1r1*$^{-/-}$ neonatal mouse brains. Cells were stimulated either with IL-1β to test glial response to inflammasome activity, or with inflammasome triggers to test endogenous inflammasome response in glial cells. Cells were then immunofluorescently stained for oligodendrocyte and inflammasome markers, respectively.
Results: Glial cells mounted an inflammasome response upon danger signal sensing. The formation of putative ASC specks denoted inflammasome activation. IL-1β increased oligodendrocyte lineage cell (OLC) numbers, promoted OPC differentiation and increased myelin production in vitro, mediated via IL-1 receptor 1 (IL-1R1).
Conclusion: Our results suggest a role for inflammasomes in glial cells, demonstrating that they can react both to danger signals via inflammasome activation, and to inflammasome products. Future work will investigate the impact of endogenous inflammasome activation on oligodendrocytes.

64. Investigating the therapeutic potential of cannabinoids on neuroinflammation in Alzheimer's disease

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Introduction: Alzheimer's disease is a neurodegenerative condition with an often-overlooked inflammatory component. Microglial cells are implicated here, with the activation of microglial toll-like receptors thought to play a major part. This study aimed to replicate the Alzheimer's-associated neuroinflammatory condition in vitro and investigate the therapeutic potential of cannabidiol (CBD).
Methods: BV2 microglia and hippocampal HPL neurons were investigated using cell treatments, Western Immunoblot and Enzyme-Linked Immunosorbent Assays (ELISAs).
BV2 microglia were treated with lipoteichoic acid (LTA) +/- amyloid beta (Aβ) +/- CBD.
HPL neurons were treated with LTA +/- Aβ and with conditioned media (CM) from activated microglia to determine the impact of microglial-derived mediators on neuronal integrity.
Results: Treatment of BV2 microglia with LTA and Aβ resulted in an increase in the expression of COX-2, iNOS and phospho-p38 and the release of IL-6 and TNF-α. These increases were attenuated with CBD treatment. HPL neurons treated with LTA and Aβ showed an increase in drebrin, syntaxin, PSD95 and phospho-ERK and a decrease in phospho-AKT. HPL treatments with CM had little impact on these proteins.
Conclusion: In HPL neurons, LTA and Aβ treatment resulted in what was interpreted as an increase in cellular proliferation, dendritic growth and synaptic signalling. While experiments regarding HPL neurons stimulated with CM were inconclusive, the potential of CBD to reduce the inflammatory condition in BV2 cells in response to our stimulants was clear. CBD therefore appears to be a promising drug candidate in meeting the large unmet clinical demand in AD and its associated inflammatory condition.

65. Nrf2 overexpression in GFAP-astrocytes decreases oxidative stress and increases reactive astrocytes after ischemic stroke

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Introduction: Stroke (cerebral ischemia) is a leading cause of death and disability. Two key pathophysiological mechanisms of ischemic brain damage are inflammation and oxidative stress. The transcription factor Nrf2 upregulates a battery of over 200 antioxidant and anti-inflammatory proteins. *In vitro* studies show that the neuroprotective effects of Nrf2 are dependent on glia, notably astrocytes. Moreover, preliminary studies show neuroprotection in mice that overexpress Nrf2 specifically in astrocytes (GFAP-Nrf2) after ischemic stroke.
Methods: In the present study, we hypothesized that the neuroprotective effect observed in GFAP-Nrf2 mice after acute ischemic stroke was due to decreased oxidative stress and inflammation. The aim was to characterize the extent of oxidative stress (3-Nitrotyrosine) and gliosis (GFAP- reactive astrocytes and Iba-1 – microglia/macrophages) with immunostaining following acute ischemic stroke (60 mins of middle cerebral artery with 23-hour survival) or sham surgery in GFAP-Nrf2 mice and wild type (C57Bl/6J) mice (n= 7-15/group).
Results: Ischemic stroke increased oxidative stress, assessed with 3-nitrotyrosine, however, there was a significant reduction in oxidative stress in GFAP-Nrf2 mice compared with WT mice. Reactive astrocytes were increased after ischemic stroke in the peri-infarct region and significantly increased in GFAP-Nrf2 mice compare to their WT counterparts. Ischemic stroke did not alter microglia/macrophages in GFAP-Nrf2 mice compared with WT mice.
Conclusion: Therefore, Nrf2 overexpression in GFAP-astrocytes has neuroprotective effects due to the alleviation of oxidative stress following an ischemic stroke. There was no evidence that this neuroprotection was caused by reduced inflammation, however there were increased reactive astrocytes GFAP-Nrf2 mice following ischemic stroke.

66. Rediscovering the route of the human dorsal hippocampal commissure

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Introduction: Considered the primary pathway of communication between bilateral hippocampi, the dorsal hippocampal commissure (DHC) crosses the midline on the lyra of the fornix. Numerous studies have been conducted on it in animals, however, there is a paucity of research in humans. Although it is recognised primarily to be the hippocampal commissure, animal studies have shown that most fibres are parahippocampal in origin. The purpose of this investigation was to determine which key limbic regions are connected by this commissure. Data has been correlated with age and gender. Another aim was to determine whether differences exist between its structure in the depressed and healthy cohorts.
Methods: High-resolution T1, T2 and HARDI were used to scan 43 healthy controls and 31 depressed subjects. CSD was used to formulate tracts. After isolating the DHC using an anatomically derived protocol, volumes of various regions were used to calculate the proportion of fibres originating from each region.
Results: In keeping with animal studies, the parahippocampal region is the primary site of origin of the DHC. There are significant reductions in volume and FA with age but no significant differences between the depressed and the healthy cohort.
Conclusion: Our findings suggest that the parahippocampal gyrus may exert more influence on the human contralateral limbic system than previously thought, with consequences in how we conceive of limbic circuitry. Though there is no effect in depression, our technique and results may have implications for memory, clinical (Alzheimer's and other neurodegenerative diseases) and epilepsy research, as well as putative treatment.

67. An investigation into the effectiveness of the 'Hello My Name Is' campaign and its impact on doctor-patient relationships in St. James's Hospital, Dublin, Ireland

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Introduction: The "Hello My Name Is" campaign was first established in 2013 by Dr. Kate Granger to remind hospital staff about the importance of introductions in healthcare. Current research highlights the importance of introductions in establishing rapport, which is essential to forming strong and successful therapeutic relationships. Strong patient-clinician communication has been associated with better health outcomes, reduced medical costs, and a decreased risk for malpractice claims. In June 2016, the campaign was launched in St.James's Hospital in Dublin. Objective: To determine whether the Hello My Name Is campaign has seen an increase in the number of healthcare workers introducing themselves to patients. A secondary objective will be to investigate the campaign's effect on communication between patients and staff within the hospital.
Methods: The survey was carried out using convenience sampling and quantitative collection methods. A total of 199 participants (93 patients, 12 visitors and 92 staff) from nine randomly selected hospital areas in SJH were surveyed.
Results: 44.64% (n=25) of patients who attended SJH before and after the campaign launch reported an improvement in the number of hospital staff introducing themselves. Since the campaign launch, 78.3% (n=78) of the 92 staff members surveyed said that they had made more of an effort to introduce themselves. 47.8% (n=11) of staff who either *sometimes* or *never* introduced themselves before the campaign launch, reported they now always introduced themselves to patients.
Conclusion: The Hello My Name Is campaign proved to be effective in encouraging more staff to introduce themselves to patients.

68. An audit of proton pump inhibitor use in a primary care setting

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Introduction: Proton pump inhibitors (PPIs) are one of the most frequently prescribed drugs in Primary Care. There has been a marked increase in PPI prescribing in recent years. PPIs have various associated side effects such as vitamin and mineral malabsorption, diarrheal illnesses and renal disease. Thus appropriate prescription is crucial for such a commonly prescribed drug with such side effects.
Methods: This audit was carried out in a rural GP practice in Ireland (n=120). Aims of this audit included analysis of PPI administration in a general practice setting. Gender, length of treatment, PPI type, dosage and indication for treatment were recorded. Administered doses and length of treatment were compared to NICE guidelines of 2014.
Results: Results showed that 73% of patients had a clinically appropriate indication for treatment, with 68% of those patients being prescribed an appropriate dose of PPI and 55% of those being on the PPI for an appropriate duration of time. These results were in line with similar studies carried out in similar settings.
Conclusion: Inappropriate use of PPIs i.e. automatic prescription, renewal and/or inappropriate indications is a concern in healthcare in general. Considering the side effect profile and increased risk of polypharmacy, it is therefore important to be aware of this in prescribing PPIs and to taper off and/or discontinue treatment appropriately in practice. Due to the results seen in this audit but also results seen in published literature, further initiatives should be developed in terms of appropriate PPI prescription and also adoption of strategies for tapering-off of prescribed PPIs.

Table 1. Adherence to clinical guidelines based on various indications for PPI use, with unknown indicating lack of documented reason for PPI.

Indication	Total (*n*=120)	Clinically Approved Indication		Appropriate dosage according to NICE 2014 guidelines		Appropriate length of treatment according to NICE 2014 guidelines	
		Yes	No	Yes	No	Yes	No
Un-investigated dyspepsia	10	10		5	5	1	9
Non-ulcer type dyspepsia	14	14		14		2	12
GORD/Barrett's	8	8		8		5	3
NSAID Prophylaxis	37	37		20	17	37	0
Non-cardiac chest pain	9	9		6	3	0	9
Gastritis	3	3		3		0	3
Dysphagia	2	2		2		1	1
Peptic Ulcer Disease	2	2		2		2	0
Other	3	0	3	0	3	0	3
Unknown	32	0	32	0	32	0	32

69. What is the best way to design a Delphi study to achieve consensus in burn outcome importance for young people and their families?

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Introduction: In 2017, 7502 children were seriously burned or scalded in the UK. [1] It has been identified that a Core Outcome Set for burn care research is needed. *[2]* However, minimal research investigating how to involve children and identify what is important to them has been conducted. We aimed to develop a method to ensure the engagement of young people participating in the development of a Burn-specific COS.
Methods: A literature review was carried out on Core Outcome Sets studies for children aged 0-18, on the COMET database. Studies were selected if they included a rating scale within the Delphi Study. This literature review was used to inform PPI and develop a survey. The survey was administered in a semi-structured interview to young people aged 10-16 years and their parents. It had two questions: which scale they preferred to use when rating importance, how they would like to receive feedback between rounds within the Delphi study.
Results: The results of the literature review established that two main rating scales are used, a 1-5 rating scale and 1-9 rating scale. Feedback included graphs, numbers or both.
The results from the PPI work was that young people and their parents prefer to rate using the 1-9 adapted traffic light scale and feedback preference was a 1-5 Likert scale presented graphically.
Conclusion: Adaptations to Delphi Questionnaires for children should be made to ensure that they understand what is being asked and can participate in COS studies. Further work is needed to standardise methods in children.

70. Hidradenitis suppurativa: Current treatment options and efficacy

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Introduction: Hidradenitis suppurativa (HS) is a chronic condition involving recurrent inflammation and secondary infection of the apocrine glands. The pain, scarring and odour associated with this disease are severely detrimental to patients' quality of life and mental health. In the present study, a literature review was conducted to evaluate the current treatment options for HS and to establish recommendations for further research.

Methods: PubMed, EMBASE, Medline and the Cochrane database were searched for papers with titles containing synonyms for HS and keywords related to its treatment. The search strategy looked at papers after 01/01/2000, while key papers before this period were included through manual search. Papers that looked at other diseases in combination with HS were excluded.
Results: 2260 papers were found for review of title/abstract. Evaluation of the evidence followed the Oxford Centre for Evidence-Based Medicine (OCEBM) guidelines. Papers with a low grade of evidence were excluded if there was higher-grade evidence available for the treatment modality in question. Duplicates were excluded. The full text was reviewed in 132 cases.
Conclusion: No therapy is able to completely induce remission of HS. There is high-grade evidence to suggest that clindamycin, adalimumab, tetracycline and certain surgeries are effective for the treatment of HS. Other treatments currently used in the clinical setting are supported by low-grade evidence. A number of emerging therapies have shown promise, particularly in cases where patients don't respond to the current first line treatments.

71. Establishing a whole body ultra-low-dose (ULD) CT protocol using pure iterative reconstruction for the assessment of shunt dysfunction in patients with hydrocephalous-Early experience

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Introduction: Surgical placement of a shunt is the most common surgical treatment in patients with hydrocephalous. Shunts include ventriculo-peritoneal (VP) (most common), ventriculo-pleural (VPL) and ventriculo-atrial (VA) shunts. Current assessment of VP shunt integrity involves CT scan of brain and assessment of tubing integrity using plain radiographic (PR) shunt series.
This study aims (a) to develop a whole-body ultra-low-dose CT protocol using pure iterative reconstruction for the assessment of shunt dysfunction in patients with hydrocephalous and (b) to investigate whether this CT protocol may provide equivalent or superior diagnostic information to PR shunt series, at a lower radiation dose.
Methods: Seven adult patients (>18 years) (mean age 49±30, range 21-87years) with suspected shunt malfunction were recruited prospectively. Patients received ULD CT and PR shunt series. All ULD CT images were reconstructed using pure iterative reconstruction (IR). Effective dose for ULD CT and PR shunt series was calculated and compared. ULD CT was compared to PR shunt series for (a) extent of shunt visualisation, (b) shunt tip visualisation and (c) presence of complications.
Results: There was an effective dose reduction (mSv) of 85% with ULD CT vs PR shunt series. ULD CT resulted in improved shunt visualisation. Ultra-low dose CT Shunt series reconstructed with pure IR allowed excellent visualisation of the entire course of shunt.
Conclusion: Ultra-low dose whole body CT, reconstructed with pure IR, is superior to PR shunt series in terms of diagnostic capability and radiation exposure. Better shunt visualisation is achieved while substantially reducing radiation exposure.

72. Patient compliance to guidelines for preoperative fasting for elective day surgery

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Introduction: A period of fasting time before surgery has long been associated with reducing anaesthetic risk during surgery especially with regards to general anaesthesia. Guidelines which were published by the American society of Anaesthesiologists recommend that the period of fasting should be six hours for solid foods and two hours for clear fluids.
Methods: A survey was distributed to patients during their stay in hospital either preoperatively or postoperatively by the medical student conducting the study. Patients were first asked to fill out some simple demographic information. Then asked about their fasting habits, as the study only focused on adult patients fasting related to breastmilk was not assessed. Patient comfort was measured using a Linkert scale and then reasons for not fasting as advised were explored.
Results: 56 patients participated in this study (58.9% female) (41.1% male). Both preoperative (51.8%) and postoperative (48.2%) patients were assessed. Fasting times for solid food was a mean of 13.58 hours (95% CI 14.15 hours - 13.01 hours). Fasting times for clear fluids was a mean of 8.89 hours (95%CI 10.04hours – 7.75 hours). Patient perceived hunger and thirst

were both negatively skewed. The post-operative group had on average lower scores on the patient comfort scale both with regards to food and fluids.
Conclusion: Patients attending the SIVUH for elective day surgery requiring the use of general anaesthesia were not fasting according to the guidelines published by the ASA. Reasons for this should be explored using a more comprehensive audit.

73. Four year follow-up of health outcome status of women with previous gestational diabetes
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Introduction: This study aims to determine the incidence of abnormal glucose tolerance among women with previous gestational diabetes (GDM) and identify the risk factors predicting this. We will review the post-natal management, the attendance at diabetes screening and whether lifestyle changes were continued 4 years post-partum.
Methods: The 426 women who attended CUMH in 2014 with a diagnosis of GDM were invited for screening for type 2 diabetes mellitus (T2DM). A questionnaire on diet and health was administered. Weight, height, waist circumference and blood pressure were measured. A standard fasting 75g oral glucose tolerance test was carried out. Biochemical parameters such as thyroid function, liver function, HbA1c levels and vitamin D status were also assessed. Standard lipid analysis was carried out.
Results: Of the 66 women screened to-date, 15 have abnormal glucose tolerance. 26 women were not screened postnatally for diabetes and a large majority (80.7%) did not adhere to the recommended lifestyle changes. Predictive factors were fasting glucose levels during pregnancy, family history of diabetes, BMI prior to the index pregnancy and body fat percentage and BMI at follow up.
Conclusion: The proportion of women with previous GDM developing abnormal glucose tolerance remains high. Early diagnosis of T2DM post GDM is being delayed. Although weight loss of 5% post-partum, lifestyle changes, breastfeeding and regular screening are recommended to these patients, this study shows that this is not being adhered to by the majority of these women. (1) This demonstrates the need for continued close follow-up.

74. Cross sectional study to assess the need to provide contraceptive services to women attending Addiction Services at Cork-Kerry Community Healthcare
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Introduction: Women with substance use disorders who have unintended pregnancies face unique challenges. A common strategy for preventing unintended pregnancies among these women is to increase their use of long acting reversible contraception (LARC). This study assessed the pregnancy history and contraceptive use of women attending Cork-Kerry Community Healthcare for opioid substitution therapy, and their access to contraceptive services. The need for a contraceptive service within the Addiction Services at Cork-Kerry Community Healthcare was evaluated.
Methods: The study utilized a cross-sectional survey administered by healthcare providers to 39 women ages 18-50 attending Cork-Kerry Community Healthcare for opioid substitution therapy. Descriptive statistics were performed using IBM SPSS Statistics Data Editor.
Results: 79% of participants had unintended pregnancies, and 23% had 3 or more unintended pregnancies. Of the participants' children, 35% lived with their mother, 37% lived in care, and 24% lived with another family member. 31% of participants had never used LARC. 22.5% of participants reported never having received information on pregnancy prevention and 25.6% reported never having received information on STI prevention. 92% of participants reported that they would use a contraceptive service if it were provided within the Addiction Services at Cork-Kerry Community Healthcare.
Conclusion: This study highlights the need to increase contraceptive services for women attending Addiction Services at Cork-Kerry Community Healthcare. Addiction Services are ideal locations to also access contraceptive services because service users already attend these clinics frequently for treatment, and thus have continuity of care with healthcare providers.

75. The structural characterization of soluble glycogen and insoluble polyglucosan associated with glycogen storage diseases

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Introduction: The improper function of either glycogen synthase (GS) or glycogen branching enzyme (GBE) is directly correlated to the several glycogen storage disorders such as Lafora disease (LD, OMIM #254780) and Adult polyglucosan body disorder (APBD, OMIM #263570). A prominent feature of LD and ABPD is the presence of insoluble polyglucosan bodies that accumulate in the skin, skeletal muscle and brain. Recent studies have demonstrated an increased average chain length in a small proportion of cellular glycogen that accumulate as polyglucosan bodies (PBs). Using mouse models of LD and APBD, we performed a structural characterization of the soluble and insoluble fractions of muscle glycogen.
Methods: *EPM2A*$^{-/-}$, *EPM2B*$^{-/-}$, *GBE1* p. Y329S and their respective wildtype mice were sacrificed at 13 months and their harvested muscle tissue was homogenized. Fractionation was performed by centrifugation to isolate the soluble and insoluble fractions. Glycogen was extracted by KOH-mediated solubilisation and repeated ethanol precipitation respectively. Each fraction underwent transmission electron microscopy and size-exclusion chromatography with multi-angle light scattering and differential refractive index (SEC-MALLS-DRI).
Results: All knockout mice demonstrated a significant accumulation of total glycogen in comparison to their wildtype controls. SEC analysis of insoluble particles demonstrated a broader distribution comparison to soluble glycogen, with a pronounced increase in smaller particles.
Conclusion: Wildtype and knockout soluble fractions showed no significant differences, suggesting that knockout mice are able to efficiently store glycogen. The quantitative and visual properties differences may unveil key information regarding the formation of polyglucosan bodies, a molecular hallmark across several glycogen storage disorders.

76. Profile of necrotizing enterocolitis in near-term and full-term infants: Retrospective study in a tertiary care NICU

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Introduction: Necrotizing enterocolitis (NEC) is one of the leading causes of morbidity and mortality in preterm infants, however, it is rare in more mature infants. The aim of this study was to clarify risk factors for the development of NEC in near-term and term infants, and examine their clinical course and outcomes in order to improve future diagnosis and management.
Methods: Infants greater than 35-weeks gestation admitted to Sick Kids Hospital from 2000-2017 with NEC were identified. Patient records of 106 infants meeting Bell criteria Stage-II or greater were reviewed. Data was analysed using descriptive statistics, and Pearson correlations were performed to investigate the role of key variables as predictors for the development of NEC, disease severity, and outcome.
Results: The mean (±SD) gestational age was 37±1.8 weeks, with mean birthweight of 2721±724 grams. We confirmed that term-NEC develops among patients exhibiting one of the known risk factors (85.9%). This included prenatal complications (57.5%); perinatal distress (51.6%); cardiac malformations, gastroschisis, and other underlying disorders (75.5%); and introduction of enteral feeding, especially exposure to cow's milk-based formulas (36.8%), with a significant correlation between type of feeds and stage of NEC ($r=0.74$, $p<0.05$). The incidence of NEC increased over the study period, with 37% born in the first nine years, and 63% born in the second nine. The survival rate (91.5%) was similar to previous reports on term infants.
Conclusion: Greater awareness of the occurrence of NEC in term neonates and the associated risk factors, should prompt preventative strategies, such as the promotion of breast feeding in at-risk infants.

77. Shunting focus: a review of ventriculoatrial shunts in paediatric practice

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Introduction: In the paediatric population, hydrocephalus is most the most common reason for neurosurgical referral and intervention. We explored the indications for, and revision rate of ventriculoatrial (VA) shunt insertion in Temple Street Children's University Hospital. VA shunts are used when ventriculoperitoneal (VP) shunts, the first line intervention, are contraindicated.
Methods: Data collection took place retrospectively in Temple Street Children's Hospital during July 2018 for the period 1st January 2010 to 1st January 2018. Data collection and follow up was performed on internal databases, patient notes, operative reports and imaging studies.
Results: We found 80% (12/15) of patients who underwent VA shunting had a prior VP shunt, while in 20% (3/15) of cases, a VA shunt was the primary intervention. We found that the most common reason for conversion from VP to VA shunts was peritonitis, which had occurred in 91% patients prior to revision. VA shunting took place first line in three patients, of whom 66% (2/3) had an ileostomy and thus VP shunting was contraindicated. At the end of the study period 60% (9/15) of VA shunts remained in situ.
Conclusion: We found a VA shunt revision rate of 40% in our study. The literature describes the revision rate of VP shunting in the paediatric cohort as between 78.2% and 84.5% over 15 years. This shows VA shunting in an acute setting, where VP shunting is contraindicated, can achieve long term control of symptomatic hydrocephalus.

78. Prevalence of polypharmacy, depression and anxiety in 197 older patients in Sligo

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Introduction: With the rising global ageing population, there is an increasing need to correctly identify the factors affecting the health of older patients to facilitate better quality healthcare. This study investigates the prevalence and the correlation to age of polypharmacy and the correlation between polypharmacy, dementia, living alone and family support on depression and anxiety.
Methods: 197 patients were identified. Descriptive and correlational analysis was used to assess the relationship between each factor. This research was approved by the Sligo Research Ethics Committee. Chi-squared, fisher exact, Mann-Whitney U test and Spearman's rho were used to analyse the non-parametric data.
Results: 197 patients identified, 19(9.6%) had missing data on medication, 121(61.5%) had more than 5 daily medications, 57(28.9%) had 5 or less daily medications with a mean of 8(4). There was a correlation found between number of medications and depression but not anxiety (P=0.010 and 0.216). There was no correlation found between age and number of medications (P=0.282). There was no correlation found between family support and depression and anxiety (P=0.182 and 0.698). There was no correlation found between living alone and depression and anxiety (P=0.628 and 0.320). There was no correlation found between dementia and depression and anxiety (P=0.323 and 0.330).
Conclusion: The results suggest that there is a high prevalence of polypharmacy in older patients in Sligo attending secondary care services and that there is a statistically significant relationship between number of medications and depression. This may relate to multiple co-morbidities and/or medication effects and warrants further investigation.

79. The role of PCSK9 inhibitors in lipid lowering therapy: A systematic review

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Introduction: PCSK9 inhibitors (PCSK9i) are a new class of lipid lowering agents indicated in statin intolerance, heterozygous familial hypercholesteraemia (HeFH) and patients refractive to statin therapy. Approved agents include evolocumab and alirocumab. Our systemic review aims to evaluate the evidence supporting cardiovascular efficacy and cost-effectiveness of PCSK9i to investigate their place in therapy.

Methods: We searched MEDLINE, EMBASE, Cochrane Library as well as National Centre for Health and Care Excellence (NICE) and National Centre for Pharmacoeconomics (NCPE) websites. A PRISMA flow chart was used to guide our search methodology. Inclusion criteria included large randomised controlled trials, real-world registry studies and cost-effectiveness analyses.
Results: This search yielded 883 articles, of which 74 met our inclusion criteria. High level evidence supports substantial LDL-C lowering using PCSK9i in statin intolerance (GAUSS-2, ODYSSEY CHOICE II), HeFH (RUTHERFORD, ODYSSEY HIGH FH) and statin refractive patients (ODYSSEY LONG TERM). High level evidence also supports efficacy in all three indications in terms of cardiovascular outcomes (FOURIER, ODYSSEY OUTCOMES). Real world evidence mirrors these positive results. However, PCSK9i do not meet cost effectiveness thresholds according to NCPE, NICE or independent studies, but may be justified in the case of HeFH.
Conclusion: Large randomised controlled trials and real-world studies support cardiovascular and lipid lowering efficacy of PCSK9i in the three indications examined. Despite this, their universal role in lipid lowering therapeutic regimens is limited by suboptimal cost-effectiveness.

80. The association of comorbid conditions, vascular access, and mortality in day 90 dialysis patients: An Irish cohort study

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Introduction: Aims and Objectives: Dialysis is indicated as the main avenue of treatment for patients suffering symptoms of End Stage Renal Disease. The identification of dialysis patients at the highest risk of mortality is essential for their subsequent care and management. To date, a comorbidity analysis on the Irish dialysis patient population has yet to be carried out with the burden of comorbidity and its effects on mortality still yet to be determined. The main objectives of this study were to:
1) Explore the differences in comorbid conditions among Irish patients undergoing dialysis
2) Determine the association of vascular access with mortality
3) Determine the association of each of these comorbidities with mortality
Methods: Data from the National Kidney Disease Surveillance System was analyzed retrospectively using a cohort of chronic hemodialysis patients treated for at least 90 days between the 01 January 2015 and the 31 December 2016 (n=528). The primary outcome of interest was mortality with covariates of interest centered upon co-morbidities present in the sample population prior to dialysis initiation, and the method of vascular access used.
Results: Patients were divided into groups according to their vascular access type at day 90 of incident dialysis. The patient's vascular access was divided into two categories – Central Venous Catheter (CVC) (n=401) and Arteriovenous Fistula (AVF) (n=127). Of the comorbidities compromising the sample population, Hypertension (56.06%), Diabetes (36.17%) and Atherosclerotic Heart Disease (16.67%) were the most prevalent across both the CVC and AVF groups. Between the two groups 89 deaths were recorded, 13 patients died in the AVF and 72 patients died in the CVC group out. The study revealed a mortality rate of dialysis patients in the Irish health system between the 01 January 2015 and the 31 December 2016 to be 16.85% (approximately 1 in 6 patients), higher in patients who received vascular access via a CVC than an AVF, increased in patients with a higher age and male gender, and was not significantly affected by the burden of comorbidity – apart from peripheral vascular disease.
Conclusion: This study was the first analysis into comorbidities and mortality in Irish haemodialysis patients, comparing AVF vs. CVC access to mortality in terms of comorbidity burden. It demonstrates the major comorbidities present in the Irish dialysis population and the variability of their effect on mortality. It highlights the necessity for future investigation in order to monitor the prevalence and effect of comorbidity on the Irish dialysis cohort.

81. Components and considerations of a critical care trial: A remap-cap sub study

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Introduction: The Platform for European Preparedness against (Re-) Emerging Epidemics (PREPARE) conducts inter-pandemic clinical research to optimise trial conduct, improve patient-centred outcomes, and inform clinical management strategies during a pandemic. One such trial is the Randomized, Embedded, Multifactorial, Adaptive Platform trial for patients with

Community-Acquired Pneumonia (REMAP-CAP) which uses multiple interventions simultaneously to determine the most effective treatments for ICU patients with CAP.
Methods: Embedded in the Irish Critical Care Clinical Trials Network, I conducted a qualitative stakeholder analysis to identify and map the key features of the REMAP-CAP trial. Data were collected through observation, analysis of trial documentation and six semi-structured interviews with essential personnel. Recurring themes and considerations were grouped and linked to specific stages of trial design.
Results: The findings highlight the multitude of components and considerations required for the successful running of multi-site trials like REMAP-CAP. Implicit but important considerations are; the implications of the novel trial design, multi-site variance in ethics and contracts, understanding within the consent process, staff engagement with the trial, randomisation and recruitment. Critical issues running throughout the trial process included time-sensitivity, feasibility of practical trial requirements, and communication between clinicians and sites.
Conclusion: Each component of REMAP-CAP is fundamental to its overall success. Stakeholders involved at different levels and sites are often unaware of the range of components of a multi-site trial. This study will inform future trial stakeholders by providing a framework of key considerations for a multi-site trial thereby helping to optimise integration of clinical research into a pandemic response. Acknowledgement: PREPARE is an EU-FP7 funded network conducting inter-pandemic clinical research on infectious diseases (http://www.prepare-europe.eu/).

82. Do nutrient and health claims have an impact on the perceived healthiness and the amount of food consumed by adults on the island of Ireland? An experimental breakfast study

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Introduction: A previous study has demonstrated that when people thought they were eating a low-calorie milkshake (versus a high-calorie labelled equivalent though same product) their physiological satiety, as measured by the gut peptide ghrelin, was consistent with what they believed they were consuming rather than the actual nutritional value. The aim of the current study was therefore to replicate this experiment using a different type of food.
Methods: On two separate occasions, participants (N=50) were asked to consume a 380 calorie yoghurt and granola breakfast product under the pretence that it is either a 500 calorie 'indulgent' breakfast or a 250 calorie 'sensible' breakfast . At each visit blood samples were collected at three time-points to measure acylated ghrelin. The blood samples were labelled baseline, anticipatory and after post-consumption. Participants were asked to complete self-reported appetite measures (visual analogue scales) 10 minutes prior to each blood sample.
Results: From anticipatory to post-consumption participants reported a significantly higher mean change in self-reported fullness score for the 'indulgent' breakfast than the 'sensible' breakfast
($p = 0.030$). This relationship was not observed for the other self-reported appetite measures at any of the time points. Mean change in acylated ghrelin was not significantly different between the breakfasts at any of the time points.
Conclusion: This experimental study demonstrated an increase in self-reported fullness after consuming the 'indulgent' breakfast compared to the 'sensible' breakfast. A physiological response, however, was not observed as mean change in acylated ghrelin was not significantly different between the breakfasts.

83. Proteomic analysis of MYCN in neuroblastoma

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Introduction: Neuroblastoma is an embryonal tumour originating from the peripheral sympathetic nervous system. MYCN amplification (seen in about 22% of cases), associated with poor patient survival, is one of the strongest determinants of clinical outcome. This project aimed to characterise the MYCN interactome in the BE(2)-C MYCN-amplified neuroblastoma cell line, and identify novel targets for the therapy of neuroblastoma.
Methods: Initially, protein-protein interaction partners of MYCN were identified by MYCN co-immunoprecipitation coupled to mass spectrometry. Analysis of this data by String and Ingenuity Pathway Analysis (IPA) software determined the most altered pathways associated with MYCN amplification, one of which is mTOR. The effect of an mTOR inhibitor, Rapamycin,

on BE(2)-C cells alone or in combination with aurora kinase inhibitors Tozasertib and alisertib was determined using microscopic phenotypic observation and cell death analysis by flow cytometry.
Results: 96 proteins were identified as MYCN interactors in BE(2)-C cells. IPA identified that the MYCN binding proteins participate in mTOR signalling and regulation of the cell cycle. All tested mono- and co-treatments decreased proliferation and increased cell death compared to the control. Aurora kinase inhibitors increased differentiation more than Rapamycin alone and co-treatments more than mono-treatments. Alisertib and Rapamycin co-treatment (48.75%) increased cell death compared to Alisertib (36.6%) or Rapamycin (10.65%) alone while there was no marked difference between Toszasertib mono- and co-treatments.
Conclusion: Targeting signalling pathways which orchestrate MYCN's oncogenic functions is an effective way to inhibit neuroblastoma growth. Further validation in pre-clinical trials is necessary to verify the synergistic potential of these new drug combinations. Acknowledgements: The authors would like to acknowledge funding from the Pathological Society of Great Britain and Ireland and the Wellcome Trust.

84. Hippocampal substructures: Changes over the normal human lifespan

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Introduction: The hippocampus is fundamental for human cognition, consisting of multiple interacting substructures working in concert deep within the medial temporal lobe. The hippocampus is vulnerable to changes during ageing, however, little is known about the alterations that occur within the substructures over the lifespan. Analysis of constituent substructures may yield more accurate information than the hippocampus as a whole. Neuroimaging advances allows for accurate delineation and volumetric quantification of these individual structures in vivo. The purpose of this study therefore is to examine the effect of age in these substructures under normal conditions.
Methods: High resolution magnetic resonance imaging was carried out on 100 healthy participants ranging from 15 to 65 years. High resolution T1 and T2 MRI data was obtained and automatic hippocampal segmentation was achieved using the Freesurfer 6.0 image analysis suite. The generated hippocampal subfields, including cornu ammonis 1-4, dentate and subiculum, were subsequently analysed with respect to age.
Results: Age and sex both had a significant effect on substructural volumes, with individual subfields changing over time, in particular reducing with age. Most substructures reduced linearly with age until dropping dramatically after age 60.
Conclusion: These age related substructural volumetric changes show that the hippocampus is dynamic overtime at the microstructural level. As the hippocampus consists of many interacting circuits of combined substructures, these variations may effect memory, spatial awareness, and emotion over time. These findings can be used as a means of differentiation between normal age-related cognitive decline and neurodegenerative conditions such as Alzheimer's disease.

85. The electronic record and the value of an alert symbol: A research study

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Introduction: Objectives: 1. To assess staff opinion on pregnancy loss alert symbols and the electronic record. 2. To determine how accessible information relating to stillbirth can be found on the electronic record by staff.
Methods: A survey was distributed to staff in CUMH where opinions were sought on topics such as the teardrop symbol, the electronic record and staff opinion on the use of a specific alert symbol highlight stillbirth on the e-record. In addition, a retrospective chart review of the 2017 CUMH stillbirth cohort (28 women) was carried out. This involved identifying certain variables around risk factors in the chart, and quantifying how easy it was to extract this information
Results: 92.9% of participants stated previous use of the teardrop symbol was extremely helpful in clinical practice and 96.8% stating that an alert symbol on the e-record would also be helpful. 55.5% of staff found specific information difficult to find on the e-record. For the chart review, 35.7% of charts had a generic alert symbol for end-of-life however, for 64.3% of these alerts

it took greater than 20 clicks to access it. 14.3% of files were identified as still continuing a pregnancy, despite the pregnancy ending in a stillbirth in 2017.
Conclusion: The introduction of a specific alert symbol would benefit clinical practice greatly as the current alert system is not working. There is a need for further education and training in navigating the e-record, so that important information can be easily sought out and to improve staff efficacy of care.

86. Bilious vomiting in infancy - the optimal workup: A research study

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Introduction: Vomiting is the forceful expulsion of gastric contents which may represent a complete or partial obstruction of the gastrointestinal tract, and, when bilious, should be assumed mainly to be due to intestinal obstruction (mechanical or functional) until proved otherwise. Possible causes are determined either from surgical or medical aspects. Accurate and swift workup of bilious vomiting is crucial as any delay or inefficiency in diagnosing may result in death of the patient. Therefore, the purpose of this review is to analyse and summate the current literature surrounding bilious vomiting in infancy and create a basic algorithm for its diagnostic workup.
Methods: A literature search was performed using PubMed to find articles that investigated the strategies being employed to produce optimal workup for infants with bilious vomiting. Altogether, 194 articles were found, of which 174 articles were excluded and a total of 20 articles were included.
Results: Upon appraising the articles in full detail, an algorithm was created as a basic guideline to the optimal workup on diagnosing bilious vomiting in infancy. The advantages, disadvantages and possible issues with respect to application of different imaging modalities are taken into account when producing the most appropriate workup. This includes findings in history taking and physical examination. The initial preferred methods of investigation apart from haematological and urine tests are Plain Abdominal Film (PFA) X-ray and ultimately, Upper Gastrointestinal Series (UGS). However, the use of abdominal ultrasound (US), and contrast enema are still useful in excluding certain differential diagnoses.
Conclusion: Above all, UGS is deemed to be the gold-standard test to exclude the most important diagnosis of intestinal obstruction.

87. Depression, anxiety and quality of life in a palliative population: A comparative study across different settings – Community and hospital

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Introduction: Palliative care patients commonly experience fluctuating moods due to the nature of their diagnosis. Management plans prioritise keeping physical pain at bay, resulting in the patient's mental health being overlooked. Understanding adjustment and depressive disorders in this population better may be an important target for improved quality-of-life.
Methods: Patients in the West of Ireland were approached in this ethically approved cross-sectional study. The scales used were Hospital Anxiety and Depression Scale (HADS), the short form of the Adjustment Disorder-New Module scale (ADMN-6) and the EQ-5D to measure quality of life. The HADS focuses on the patient's recent emotional responses experienced whereas the EQ-5D is a 5-item validated scale which explores functioning in activities of daily living and related quality of life.
Results: Of all patients approached 30 agreed to participate in the study. Adjustment disorder- New module 6 (ADNM-6) highlighted 63.13% of patients whose situation was a burden to them. 52.63% of patients admit to 'supressing' their feelings with others while but only 15.79% of participants say they have withdrawn from friends and family. The Quality-of-Life questionnaire reported 42.11% of patients to be moderately depressed. Finally, when asked to rate their current health on a scale, a mean of 56 was obtained.
Conclusion: Working with a sensitive and acutely ill cohort has its challenges. This pilot study will deepen our understanding of the psychological and overall care requirements of palliative care patients. The data collected suggests that end-of-life patients require mental health care to complement their physical management.

88. Are ER+ breast cancer cells *de novo* resistant or do they acquire their resistance to Tamoxifen therapy?

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Introduction: Breast cancer is one of the leading causes of death in women. Anti-endocrine therapies such as Tamoxifen are often used to treat it. However, 30% of them develop resistance, posing a significant challenge clinically. Early events in endocrine resistance are poorly understood. Previous work in this lab has identified SSEA1+ cells as drivers of tamoxifen resistance in ER+ breast cancer. It was found that these cells were not *de novo* resistant, but rather acquired this feature. This led us to asking ''Are ER+ breast cancer cells in additional tissue culture models and patient tissue samples de novo resistant or do they acquire their resistance to Tamoxifen therapy?''
Methods: Tissue culture and flow cytometry was performed on the T47D cell line in vehicle, estrogen and estrogen and Tamoxifen. The cells were subsequently stained with DCO and anti-SSEA1-APC to measure progress through the cell cycle with respect to SSEA1 marked sub-populations. Immunohistochemistry/Immunofluorescence was also performed using primary and secondary antibodies against SSEA1 and Ki-67.
Results: Analysis of the T47D cell line confirmed the previous findings that SSEA1+ cells are not *de novo* resistant. Unfortunately, there was insufficient proliferation in *ex vivo* tumour samples to confirm or reject the hypothesis.
Conclusion: This study has helped in understanding this particular cell type (SSEA1+)that drives endocrine resistance in breast cancer. RNA sequencing could further be employed to understand key genes that differ between SSEA1+ and SSEA- cell types which could potentially be used as biomarkers of prognosis or targets of therapy in the future.

89. Early satiety in cancer: A clinical review of definition and therapeutic management

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Introduction: Early satiety is a common symptom of cancer that is rarely recognised in medical practice and poorly elucidated in the literature. It is defined as the desire to eat with the inability to eat appropriate amounts due to premature fullness. The present review aims to highlight the clinical importance of early satiety and outline appropriate therapeutic treatment.
Methods: A literature search was conducted on October 27, 2017 using EMBASE, CINAHL and SCOPUS to determine therapeutic management of early satiety in cancer. The search was limited to English language and peer-reviewed journals. Articles were screened in four stages by two reviewers.
Results: Of 486 articles identified, 5 full-text articles were included comprising of 3 original articles and 2 reviews. Targeting central and peripheral mechanisms are key to symptom management. Peripherally acting prokinetics such as metoclopramide are considered first line therapy. Immunomodulators such as OHR118 and thalidomide have positive effects, however large randomised trials are necessary to validate these findings. Agents that target gastric accommodation such as clonidine, sumatriptan and sildenafil may also be useful. Centrally acting pharmacological agents affect hormones associated with digestion. Examples include: progesterone receptor agonists such as megastrerol acetate, cannabinoids that downregulate corticotropin-releasing hormone and ghrelin agonists.
Conclusion: Overall, early satiety is an under-recognised but an important symptom in cancer. High quality studies outlining appropriate therapeutic management are not currently available, yet are necessary to establish standardised treatment protocols. Translational research is required to improve our understanding of early satiety and uncover novel therapies.

90. Investigating the effects of FTY270 and BAF312 in a mouse model of Alzheimer's disease

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Introduction: Alzheimer's disease is a chronic neurodegenerative disease that results in deterioration of cognitive processes leading to memory, language, learning and behavioural dysfunction. Sphingosine-1-phosphate is a signalling sphingolipid that

has a neuroprotective role and its signalling is dysregulated in Alzheimer's disease. This study sought to investigate the effects of sphingosine-1-phosphate receptor modulators, FTY720 and BAF312, on behavioural deficits, inflammation, oxidative stress and pathological hallmarks in the triple transgenic mouse model of Alzheimer's disease (3xTg-AD).
Methods: Behavioural impairments were investigated using the Morris water maze to assess spatial learning and memory in the mice. Levels of astrocytic and microglial gliosis were investigated using immunohistochemistry and Western blotting to measure glial fibrillary acidic protein and ionised calcium-binding adaptor molecule 1 expression. Expression of tau, phosphorylated tau and superoxide dismutase 2 were investigated using the Western blot technique.
Results: The results of the Morris water maze demonstrate that the 3xTg-AD mice perform significantly worse than the wild type control mice treated H_2O. The performance of the 3x-Tg-AD mice that were treated with FTY720 and BAF312 matched that of the wild type controls. Expression levels of glial fibrillary acidic protein, ionised calcium-binding adaptor molecule, tau, phosphorylated tau and superoxide dismutase 2 were not affected by treatment with FTY720 or BAF312 in the 3xTg-AD mice.
Conclusion: These results suggest that sphingonsine-1-phosphate receptor modulation alleviates the spatial memory and learning impairment in 3xTg-AD mice, however, it does not reduce astrocytic or microglial gliosis, tau pathologies, or oxidative stress.

91. Investigations on bone morphometry and bone mineral density distribution (BMDD) among osteoarthritic (OA), osteoporotic (OP) and type 2 diabetic (DB) patients

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Introduction: Type II diabetes has been known to compromise bone microstructure, increasing patient's fracture risk even with normal Bone Mineral Density (BMD). However, mineral heterogeneity in diabetic human bone still unknown. Aim: The aim of this study is to compare human trabecular bone morphometry, stiffness and strength, and mineral heterogeneity in patients presenting either with (n=5)DB, (n=10)OP or (n=5)OA controls, focusing mainly on central region of human femoral head (HFH).
Methods: 20 HFH were obtained from consented patients age 55-90, n=6(Males) and n=14(Females) undergoing hip replacement surgery in 2 local hospitals. 4-8 bone cores from the central region were scanned using MicroCT to obtain 3-Dimensional X-ray images. They were then tested using a Zwick tensile/compression testing machine. T-test was used to determine statistical significance ($p<0.05$).
Results: Bone morphometry in OP were significantly decreased compared to OA and DB respectively, characterized by significant decrease in BoneVolume/TrabecularVolume (-16.3% and -20.7%), Trabecular.Number (-11.0% and -9.9%), Trabecular.Thickness (-6.9**%** and -11.9%), and significant increase in Trabecular.Space (+9.5% and +11.8%). Additionally, significant decrease in Stiffness (-58.7% and -60.8%) and Yield Stress (-54.2% and -60.8%). BMDD analysis showed significant increase in OP compared to OA and DB respectively, Peak (+5.0% and +6.4%), full width at half maximum (FWHM) (+31.0% and +13.8%). Compared to OA, DB had a significant increase in FWHM (+15.2%).
Conclusion: OP vs OA and OP vs DB are statistically significant. DB vs OA, only significant increase in FWHM, indicating more heterogeneity in DB which might be contributing factor to bone brittleness compared to OA. Acknowledgement: NUI Galway, School of Medicine (Sponsor); Dr Eoin Parle (Mentor), Prof Laoise McNamara (Supervisor) in Biomedical Engineering; Surgeons and Staffs at Merlin Park University Hospital and University Hospital Galway, CoEI and CMNHS at NUI Galway; Dr Roisin Dwyer (Undergraduate Research Coordinator).

92. Regulation of complement using AUR-1400 and AUR-1402: A scratch wound assay analysis

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Introduction: Conditions such as atypical Hemolytic Uremic Syndrome (aHUS) arise from the dysregulation of the complement alternative pathway (AP). We have previously shown (unpublished data) that complement activation slowed endothelial wound healing. An *in vitro* scratch wound assay was used to examine the rate of wound healing and migration of cells. AUR-

1400 and AUR-1402 are derivatives of aurin tricarboxylic acid (ATA), a recently identified complement blocker. The goal was to determine the effects of AUR-1400 and AUR-1402 on complement activation and cell motility.
Methods: Blood outgrowth endothelial cells (BOECs) were exposed to media (complement inactive), 50% normal human serum (NHS; complement active) with or without AUR-1400 or AUR-1402. BOECs were grown to ca. 80% confluency and the centre of the monolayer was scratched. Light microscopy images were taken at baseline and every 2h after treatment for a total of 6h to quantify cell migration rates. Percentage of wound healing of the monolayer was quantified to observe the impact of the novel complement blockers.
Results: Treatment with media only and 50% NHS conditions had approximately the same migration rate. A combination of AUR-1400 and serum had a greater percentage recovery (31%) than in media, serum and AUR-1400 only conditions (n=3). The cells treated with AUR-1402 and serum also had an effect on complement's inhibition of cell migration (n=3), compared to the other conditions (18% difference).
Conclusion: Endothelial cell motility increased when cells were incubated with both serum and AUR-1400 or AUR-1402. AUR-1400 and AUR-1402 are potential complement blocking agents.

93. Macrosomia and maternal care for excessive foetal growth in Cork University Maternity Hospital (CUMH)

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Introduction: Macrosomia is defined as an estimated foetal weight over 97th percentile and carries important maternal and foetal risks. Additionally, it is also suspected to increase rates of a routine induction of labour (IOL) or an elective caesarean section (CS). This study aims to investigate the risk factors for macrosomia diagnosis, perinatal maternal and foetal outcomes and to evaluate the accuracy of macrosomia diagnosis in CUMH.
Methods: This is a retrospective cross-sectional study of macrosomia (n=51) and the comparison (n=117) cases, identified in the HIPE system. Data was extracted from clinical charts and surgical records and analysed using SPSS software.
Results: We established that macrosomia diagnosis correlates significantly with: maternal age over 30, BMI>30, private health care status, no previous CS; and inversely correlates with nulliparity. Mode of delivery for macrosomia *vs.* comparison group was IOL 80.4%, CS 37.25% and IOL 24.8%, CS 40.2% respectively. As a consequence of IOL, the gestation was shorter in macrosomia. No difference in maternal complications and foetal outcomes - measured by APGAR 1min score, was found. Surprisingly, BW of macrosomia and comparison groups were similar. Sensitivity and specificity of macrosomia diagnosis was poor (30 and 69%). Interestingly, after stratification between public and private patients, sensitivity was 14% *vs.* 54% and specificity 85% *vs.* 33%.
Conclusion: This study demonstrated that sensitivity of macrosomia diagnosis is quite poor although better in the private system. Once diagnosed, patients routinely undergo an IOL of labour without clear evidence of an increased risk of maternal and foetal complications.

94. Blurred lines: Verbal sexual coercion in hookup culture on college campuses

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Introduction and Objectives: Hookup culture has normalized casual sexual encounters on college campuses. These sexual encounters are associated with increased risk of victimization. Sexual coercion is a form of sexual victimization that occurs at equal or higher rates than sexual assault. The objectives of this study were 1) determine the incidence of verbal sexual coercion within hook up culture and 2) improve the understanding of students experience of verbal sexual coercion.
Methods: A sample of 208 undergraduate students at a mid-sized urban campus in the United States completed an online survey about their experience with two specific coercion scripts. Script 1: feeling pressure to go beyond your comfort zone in a hookup because the other person asked multiple times. Script 2: feeling pressure to go beyond your comfort zone in a hookup because the person expressed they had feelings for you.
Results: Of the 208 participants, 63.5% had engaged in a hookup within the last 12 months. Of those participants 46% had experienced one or both verbal sexual coercion scripts. When asked how they felt after these hookups and how they would categorize them the majority of subjects did not feel positively (89.9%) yet categorized the hook up as normal (87.3%).

Conclusion: The results show verbal sexual coercion exists within hookups. Also, this coercion is accepted as normal by students despite not feeling positively after the hookup. This information can be used to educate and improve university programming to reduce sexual coercion as a form of sexual victimization.

95. Prevalence of risk-factors for cardiovascular disease in patients with Psychosis in Munster

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Introduction: Psychosis is a pathological state of mind characterized by the presence of hallucinations and delusions. It is commonly caused by schizophrenia, characterized by positive symptoms including psychosis and negative symptoms including social withdrawal lasting longer than 6 months per DSM-5. Patients with schizophrenia suffer from reduced life expectancy, even with suicide controlled for, with cardiovascular disease (CD) remaining the leading cause of death. New studies have associated psychotic disorders with altered gut microbiota, through a possible manifestation in the brain-gut axis. Risk factors for CD, including obesity and increased waist-hit ratio have also been linked with altered gut microbiota.
Methods: Risk factors for CD (waist-hip ratio, BMI≥25, smoking status and history, hypercholesterolemia, hypertension, and diabetes) will be assessed. 50 patients aged≥18 with psychosis will be recruited along with 50 controls without psychosis. Patients with comorbid psychiatric conditions and CD were excluded.
Results: To date, 61 total patients have been recruited (30 control, 25 schizophrenia, 3 schizoaffective, 1 major depressive disorder with psychotic features, 1 bipolar psychotic subtype, and 1 first episode psychosis). Mean hip-waist ratio was 0.9697+/-0.04983 for controls, 1.0415+/-0.10987 for schizophrenia, and 1.0657+/-0.18914 for schizoaffective disorder(one-way ANOVA, P=0.045*). 6.7%(2/30) of controls reported being current smokers, compared to 40% (10/25) in schizophrenia and 66.7% (2/3) in schizoaffective (chi-squared P=0.005*). In controls, 6.67%(2/30) reported T2DM and 0.067%(2/30) reported T1DM compared to 52%(13/25) for T2DM in schizophrenia and 66.67%(2/3) in schizoaffective disorder (chi-squared P=0.030*).
Conclusion: Psychosis is significantly associated with increased waist-hip ratio, T2DM, and being a current smoker relative to controls.

96. Widening access to medical school: Looking at the impact medical student-run interview courses have on confidence and breaking down barriers

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Introduction: swotUP is a student society founded by medical students which aims to widen access to medicine by running interview courses for school/graduate applicants. This study focuses on how the courses affect students' knowledge of the application process and confidence in their interview technique as well as looking at difficulties/stresses faced when applying to medical school.
Methods: This study included school students aged 17-18 (n=29) who attended a swotUP interview course. Attendees filled in a questionnaire before the course began, addressing their understanding of the application process and confidence dealing with ethical dilemmas, multiple mini interviews (MMIs) and traditional interviews as well as exploring any difficulties or disadvantages the students had faced so far in the process. After taking part in MMI, traditional interview and ethical workshops led by medical students, attendees completed another questionnaire, seeing how the course had affected their confidence/perceptions.
Results: The course increased average awareness levels of the application process and confidence of medical school acceptance as well as increasing confidence in MMIs, traditional interviews and ethics (average confidence increase of 22.3%). The majority of students surveyed said they found the application process stressful and they felt they were under additional stress compared to their peers applying to other degrees.
Conclusion: The study showed the courses were helpful at increasing students' confidence levels however some still felt at a disadvantage due to financial/social barriers. In addition to running further courses, we have launched a blog to help address these issues.

97. Development of a microbial burden-responsive antimicrobial hydrogel for the prevention of catheter related infection

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Introduction: Catheter-related bloodstream infections (CRBSI) majorly contribute to morbidity and mortality. Hydrogels that release of antimicrobials in the presence of bacteria may prevent biofilm formation on catheter surfaces, thus negating their need for removal which can limit optimal therapy. Aim: Investigate the potential of an antimicrobial hydrogel as a microbial burden responsive coating to prevent biofilm formation on central venous catheters.
Methods: A collection of isolates causing CRBSI in Galway University Hospital were assessed for their biofilm forming ability via crystal violet assay. Their minimum inhibitory concentrations (MICs) for the fluoroquinolone antibiotic levofloxacin were determined via broth microdilution. Responsive drug release from Ascorbyl Palmitate (AP) hydrogels was assessed using the fluorescent dye Nile Red. *In vitro* efficacy of levofloxacin loaded/unloaded AP hydrogels against CRBSI were assessed by *Klebsiella pneumoniae* time course killing assays in broth cultures.
Results: *K. pneumoniae*, *Enterococcus faecalis* and *Staphylococcus aureus* CRBSI isolates formed strong biofilms (OD_{490} ≥1.2). Their levofloxacin MICs were <0.125, 64 and >256 µg/ml, respectively. AP hydrogels demonstrated release of fluorescent dye in the presence of conditioned bacterial culture media. AP hydrogels reduced the number of *K. pneumoniae* cells by 2 $\log_{10}$ after 3h and completely inhibited growth between 6 and 24 hours. AP hydrogels loaded with 10 x MIC levofloxacin completely inhibited bacterial growth for at least 80h.
Conclusion: AP hydrogels with or without levofloxacin inhibited bacterial growth *in vitro* and have potential for further development as responsive anti-biofilm catheter coatings. Acknowledgements: This study was funded by a HRB Summer Student Scholarship 2018.

98. Use of screlotherapy embolization in treatment of venous malformation in a paediatric setting

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Introduction: Venous Malformations (VM) are a slow flow form of vascular malformation, resulting from defects in angiogenesis and vasculogenesis. Present from birth, they consist of haemodynamically non-functional venous lakes. 94% of VM are sporadic. Symptoms, including pain, swelling, functional impairment and bleeding, vary depending on the location of the VM, and extent of localised venous thrombosis.
Method: The project aim is to review basic concepts of VM and their treatment using sclerotherapy, through observing procedures, and following cases in a paediatric setting.
Results: Sclerotherapy uses image guided minimally invasive techniques to elicit a controlled inflammatory response, resulting in fibroblast proliferation and sclerosis of the VM. Direct puncture venography is used to prevent sclerosis of functional veins. Treatment options including bleomycin, have a high efficacy but also significant risks and side effects including hyperpigmentation and pulmonary fibrosis.
Conclusion: Repeated sclerotherapy is used in the reduction of symptomatic VM, with clinical response approaching 100%.

99. Acute and chronic anxiety responses to sprint interval training: A pilot study

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Introduction: The literature supports anxiolytic effects of exercise in a variety of populations. However, acute and chronic anxiety responses to sprint interval training (SIT) have not been established. The objectives were to quantify (1) state anxiety and mood state responses to a single SIT session; (2) change in acute responses between initial and final SIT sessions; and (3) effects of three weeks of SIT on state anxiety and mood states among otherwise healthy young adult males.

Methods: Seven young adult males (21.4±4.9 years) completed a 3-week SIT intervention, consisting of nine sessions with 4-6 30s Wingate sprints each. Acute and chronic effects of SIT on state anxiety and mood states were assessed using the State-Trait Anxiety Inventory and Profile of Mood States – Brief respectively.
Results: Following initial SIT session, state anxiety (t6=-4.13, p=0.006), feelings of fatigue (t6=-7.76, p<0.001) and total mood disturbance (t6=-5.53, p=0.001) were significantly increased. All were large magnitude increases: state anxiety (d=-1.10), feelings of fatigue (d=-3.91), and total mood disturbance (d=-1.35). Repeated sessions ANOVA found a significant main effect for time for feelings of fatigue (F(1,6)=24.50, p=0.003). This represents a moderate attenuation in feelings of fatigue (d=-0.76, 95%CI:-1.85, 0.32). No other changes in acute response were observed. A significant moderate decrease (d=0.56) in total mood disturbance (t6=2.87, p=0.028) was found following three weeks of SIT.
Conclusion: Findings indicate that a single SIT session can acutely increase state anxiety, fatigue and mood disturbance. However, short term SIT may elicit a moderate decrease in total mood disturbance in otherwise healthy young males.

100. An investigation into the factors affecting investigator initiated trial start up and completion in Ireland

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Introduction: In the past 5 years approximately 499 clinical trials have been active in Ireland.
These trials are essential to:

- Test new therapeutic interventions
- Develop clinical management strategies

Despite this, considerable challenges and delays can arise before the trial has commenced.
This project aims to identify the contractual, ethical, logistical and regulatory barriers that hinder the start-up of investigator-led trials in Ireland.
Methods: This was achieved using a two-fold approach. Firstly, an online survey targeted investigators in Ireland. It was distributed and gathered a comprehensive data-set which helped to profile the prominent hurdles encountered during study start-up. Following this, over-the-phone interviews were carried out with this years' Definitive Intervention Feasibility Awardees (DIFA) and similar questions extracted a more qualitative data set.
Results: Regarding the online survey, a total of 42 survey responses were received. The respondents were asked about their most recent trial and were asked to indicate timelines for trial activities, as listed in the table below.

	<4 week	1-6 months	6-12 months	1-2 years	2-3 years
Site Selection	13.3%	53.3%	13.3%	13.3%	
Ethical Approval	5.6%	77.8%	11.1%	5.6%	
Contracting	5.6%	61.1%	16.7%	11.1%	5.6%
Initial contact-Study Start-Up	5.3%	47.4%	15.8%	26.3%	5.3%

Regarding the DIFA interviews, 11 out of 12 were available. All were experienced trialists with involvement in 93 trials over the last 5 years collectively. Similar issues were found to hinder trial start-up, namely delays associated with contracting and ethics.
Conclusion: This study has uncovered the prime culprits of trial hindrance in Ireland as highlighted by active trial staff whose opinions are rooted in experience. Ultimately, it appears that many factors impact trial progression, however delays associated with contracting and ethics are perceived consistently as the major barriers to investigator initiated trial start-up and completion in Ireland.

101. Potential regulation of glutamine synthetase levels by miR-21 in epilepsy

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Introduction: A reduction in glutamine synthetase (GS) levels in astrocytes has been implicated in the pathogenesis of mesial temporal lobe epilepsy (MTLE) according to the glutamate hypothesis. The hypothesis infers that as GS is responsible for glutamate clearance and glutamate-glutamine cycling, seizures can occur as a result of the amplification of glutamatergic activity in the hippocampus. With growing understanding of the role of micro-RNAs (miRNAs) in post-translational modification and silencing of genes, we hypothesise that this may be the mechanism by which glutamine synthetase is reduced in patients with refractory MTLE.
Methods: MiRNA target prediction results obtained from TargetScan, miRtarbase and microRNA.org were compared with miRNA found to be elevated in epilepsy in literature and in the epimirRNA database. Following this, miR-21 was identified as a possible target for the GLUL gene which encodes GS.
QPCR and immunohistochemistry were performed on samples from a kainic acid mouse model and a human TLE patient to observe differences in the levels of GS, GLUL mRNA and miR-21 at different time points post-status epilepticus (SE), compared to a PBS-injected control.
Results: Levels of both miR-21-5p and GLUL mRNA associated to the RISC complex increased at 72 hours post-SE. A quantitative Western Blot showed decreased levels of glutamine synthetase in the hippocampus, with lowest levels at 72 hours post-SE.
Conclusion: As there appears to be a correlation between increased levels of miR-21 and decreased levels of GS in the hippocampus at 72 hours post-SE, miR-21 may play a role in downregulating GS and increasing glutamatergic signalling in the brain. Patients with medically refractory epilepsy may therefore benefit from treatment with a miR-21 antagomir which could block miR-21 from binding to GLUL mRNA, increasing expression of glutamine synthetase, preventing excessive epileptogenic glutamatergic activity.

Conflicts of Interest
The authors declare that they have no conflict of interests.

Authors' Contributions
NQ: Served as a planning committee member for the conference, negotiated sponsorship deals for the conference, invited speakers for the conference, assisted authors with their abstract submissions, drafted the conference abstract booklet, and gave final approval of the version to be published.
SC: Served as a planning committee member for the conference, organised the judging panel for the conference, invited speakers for the conference, assisted authors with their abstract submissions, drafted the conference abstract booklet, and gave final approval of the version to be published.
SL: Served as a planning committee member for the conference & UCD Medical Society Secretary, organised the judging panel for the conference, and gave final approval of the version to be published.
ED: Served as a planning committee member for the conference & UCD Medical Society Treasurer, negotiated sponsorship deals for the conference, and gave final approval of the version to be published.
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