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## 1. Analysis of antibodies in patients with Anti-Hu syndrome

Avithra Amber Shivarajan, Victoria Barnard, Berne Ferry, Paul Maddison, Caroline J Chapman

**Background:** Immune-mediated paraneoplastic neurological syndromes (PNS) arise due to the indirect effects of cancer on the nervous system. A number of well characterised antibodies, associated with several different neurological disorders and cancers, have been described, with Anti-Hu being the most common. Typically, most patients (at least 80%) with anti-Hu syndrome will harbour small cell lung cancer (SCLC), a malignancy with poor prognosis due to late onset of symptoms. Antibodies specific for Tumour associated antigens (TAAs) are often associated with cancer, presenting in some cases, before symptoms have arisen, signifying their great diagnostic worth. This study analysed the presence of antibodies to TAAs SOX-2, p53 and Hu-D, by ELISA to determine their diagnostic and predictive value for SCLC, in patients with anti-Hu syndrome.

**Methods:** 81 samples from patients with anti-Hu syndrome and matched healthy controls were analysed by ELISA for Hu-D, SOX-2 and p53 IgG autoantibodies. Patients with anti-Hu syndrome were confirmed by neurological presentation and Ravo (anti-Hu) Immunoblot, and categorised into: known cancer, at-risk and unknown groups.

**Results:** All 81 samples confirmed positive for anti-Hu antibodies by ELISA. Antibodies to SOX-2 were significantly raised in the patients with anti-Hu syndrome at a sensitivity of 41%, and specificity of 96% ( $p < 0.001$ , compared to healthy controls). Antibodies to p53 were also raised in these patients at a sensitivity of 11%, and specificity of 99% ( $p < 0.05$ ).

**Conclusion:** The positive anti-Hu antibody measurements in all samples implicate ELISA as an appropriate technique for confirming antibody positivity. Of the Anti-Hu syndrome patients with a known cancer, 85% had SCLC. The strong association between the presence of SOX2 autoantibodies and SCLC, in anti-Hu syndrome patients, highlights its potential as a diagnostic aid for the identification of cancer in these high risk patients. Results for autoantibodies to p53 also indicate an association with cancer.

## 2. Homeless patients' crisis use of A&E- their failure or ours?

Emma Dorothy Mills, Christopher Burton, Catriona Matheson

**Background:** Ensuring homeless persons engage with appropriate healthcare is essential in tackling the ever widening disparities in health between the homeless population and the general public. Understanding the ways in which homeless patients' access services and the barriers impeding patients' engagement with primary care is an important step to improving the accessibility and utilisation of health services.

**Aims:** To explore how health professionals conceptualise engagement with healthcare among the homeless community, and the perceived barriers patients face when accessing care.

**Methods:** Semi-structured telephone interviews were conducted with healthcare professionals whose work primarily involved homeless or recently homeless patients. Purposive sampling was employed to recruit participants with varying experience, and ensure a range of practice type and location. Data analysis followed a framework approach, including thematic analysis.

**Results:** Data saturation was achieved after 13 interviews. Participants' accounts demonstrated that systematic barriers to engagement perpetuate inappropriate use of services among homeless patients and in turn, compound feeling of distrust and stigmatisation. A key emergent theme was homeless patients' use of A&E departments as substitutes for primary care. Whilst it was suggested this is related to the impulsivity and serial crises often faced by homeless patients, others claimed it is intrinsically linked to the numerous barriers homeless patients face when attempting to access mainstream GP practices.

**Conclusion:** There appears to be a systematic failure of mainstream health services engaging with homeless patients, a consequence of which is crisis use of A&E facilities. The challenges preventing homeless patients' inclusion into mainstream services are therefore requiring of further research.

### 3. Give it a Breast: Factors Influencing Breast or Formula Feeding in University Hospital Galway

Rynagh Cummins, Aine Stenson, Edina Moylett

**Background:** Irish breastfeeding rates are poor; reasons influencing decision to breast or formula feed are complex.

**Aims:** To obtain information from post-partum mothers concerning their: infant feeding choice including influencing factors, knowledge of breastfeeding and satisfaction with their chosen method.

**Methods:** Over an 8-week period a questionnaire-based study was conducted on the postnatal ward (PNW) of UHG. Consenting mothers completed a primary survey prior to discharge agreeing to a 6-week follow-up telephone interview. Questionnaire data included relevant obstetric and demographic information; telephone interviews included information on feeding choice, influencing factors, breastfeeding knowledge and overall satisfaction. Data were analysed utilizing SPSS (20).

**Results:** 234 mothers were approached, 217 primary surveys completed, 201 (92.6%) 6-week telephone interviews completed; 69% vaginal delivery, 31% caesarean section; 77% native Irish. At 6 weeks, 107 (53%) mothers (native Irish, 71%) were breastfeeding (vaginal delivery more likely to breast feed,  $P = 0.028$ ), the principle influencing factor reported was 'best for baby' (95%). Among formula feeding mothers, the principle reason for not breastfeeding was apprehension regarding infant satisfaction (37%); 49% of mothers decided to formula feed pre conception, 50% would consider future breastfeeding with additional support. 86% of breast- and 96% of formula feeders favoured available infant formula on the PNW; overall, knowledge of breastfeeding benefits was poor.

**Conclusion:** 53% of mothers were breastfeeding at 6 weeks. There is scope to improve this figure with more intensive education and support in the pre- and immediate post-natal periods. A 6 month follow-up survey will determine the true breastfeeding rate.

## 4. An evaluation of a bidirectional flow valve on Peripherally Inserted Central Catheter occlusion rates in Intensive Care

Isabelle Kamenou, Matt C Ellington, Christiana Georgiou, Andrew J Johnston

**Background:** Peripherally Inserted Central Catheters (PICCs) are now commonplace among critically ill patients and provide short to medium term central venous access. One of the most common complications is catheter occlusion. This service evaluation was designed to evaluate the effect of bidirectional flow valves on PICC line blockage rates.

**Methods:** Blockage rates were audited over a period of 237 catheter-days for the standard PICC line used on our intensive care unit. PICC lines were then fitted with bidirectional flow valves and the blockage rate re-audited.

**Results:** The overall catheter occlusion rate without the bidirectional flow valves was 139 occlusions per 1000 catheter days. There was also a 36.8% overall risk of occlusion per catheter. The presence of a bidirectional flow valve was associated with an occlusion rate of 109 per 1000 catheter days and a risk of 26.5%, however these results were not statistically significant.

**Conclusion:** Additional bidirectional flow valves do not appear to influence PICC line blockage rates for intensive care patients.

## 5. Idiopathic Toe walking – a follow-up survey of gait analysis patients in the Central Remedial Clinic (CRC)

Khalid Munir, Rory O'Sullivan, Louise Keating

**Background:** Idiopathic toe-walking (ITW) is walking on the toes after two years of age without neurological abnormalities. It is a diagnosis of exclusion. Gait analysis (GA) is thought to be useful in diagnosing ITW and recommending a treatment approach, which are largely debated.

**Objectives:** To survey patients who previously underwent GA and were classified as typical or atypical of ITW. To determine agreement with a subsequent diagnosis, if one was made, and if recommended treatment approaches were abided by and how successful they were.

**Methods:** All patients to CRC's Gait Lab with queried ITW between May 2002 and May 2013 (n=102) were invited to participate in a retrospective postal survey consisting of three sections: birth history; walking history; investigations, diagnosis and treatment. Ethical approval was obtained from the local ethics committee. Funding was provided for this study by the RCSI Undergraduate Research Summer School Student Fund.

**Results:** A response rate of 41% (n=39) was achieved. Of the respondents, 79% (n=31) were identified to be typical of ITW at the time of GA. Of the other eight subjects, 50% (n=4) reported receiving a diagnosis other than ITW. Twenty-five subjects who were reported as toe-walkers completed treatment section. 68% (n=17) of those with ITW received treatment, either conservative or surgical, that was recommended by CRC. Surgical intervention was reported as having most benefit in resolution of toe-walking.

**Conclusion:** GA is a useful objective tool for diagnosing ITW and can be beneficial in recommending a treatment approach.

## 6. Cervical Cancer prevention and screening knowledge amongst women of Nigeria from different socioeconomic backgrounds

Mina Mesri, Maheshi Wijesekera, Mu-Chun Chiang

**Background:** Cervical cancer (CC) carries a high mortality if not detected and treated early. It is the highest prevalent gynaecological malignancy in Nigeria. Screening for CC and vaccination against it has shown to be effective in decreasing the numbers. Implementing these in Nigeria has proven to be difficult due to lack of financial support from GAVI and QIAGEN (donor agencies) who claim that Nigeria is unprepared for HPV vaccination, lacking sufficient healthcare infrastructure.

We aim to conduct a structured review assessing the awareness of CC, CC screening and HPV vaccination amongst different socioeconomic populations in Nigeria.

**Methods:** Medline and PubMed databases were searched for articles published between 2000-current. These publications were evaluated and selected with their references searched for further publications.

**Results:** A total of 14 studies were identified amounting to 7,001 participants. These studies are heterogeneous with regards to the population, questionnaire designs, study quality and generalisability. Participants were divided into healthcare-professional, non-healthcare professionals and non-professional population (including slums). 74.2% healthcare professionals were aware of the HPV vaccine. 62% of non-healthcare professionals were aware of CC with similarly low rates of HPV vaccination and screening awareness. The poorest levels of awareness of CC were observed amongst non-professionals (36.5%). Shockingly, only 4.2% of awareness of CC and 0% of any screening test was observed amongst two slum populations.

**Conclusion:** There exists a low level of awareness of CC, CC screening and HPV vaccination amongst non-healthcare professionals. Efforts need to be intensified to provide education to this under-served population, most at risk of CC. While findings revealed that health professionals had adequate awareness of CC, education of non-healthcare professionals holds the key for prevention of CC in Nigeria. Education and appropriate communication strategies will ensure sufficient healthcare infrastructure prior to successful implementation of donor agencies' subsidisation policies.

## 7. The evaluation of a novel, long-term antimicrobial urinary catheter; preventing the migration of *Proteus mirabilis*

Anil Krishan

**Background:** Catheter-associated urinary tract infection (CAUTI) is a major cause of morbidity in patients undergoing long-term urinary catheterisation. Although symptomatic episodes can lead to complications such as pyelonephritis, a long-term catheter capable of preventing infection is not currently available. *Proteus mirabilis*, responsible for ~40% of CAUTI's, forms a crystalline biofilm that obstructs catheters. On contact with a surface, *Proteus* can differentiate into elongated swarmer cells which move rapidly in a coordinated manner. It has been hypothesised that this differentiation is responsible for migration along urinary catheters.

**Objectives:** This study aimed to further explore the role of swarming by *P. mirabilis* in migration along the extra-luminal catheter surface. A secondary aim was to investigate the ability of a novel, antimicrobial-impregnated catheter to inhibit *Proteus* migration along this surface.

**Methods:** An *in vitro* model was used to compare the ability of one wild type strain and four swarming-deficient transposon mutants to migrate along a silicone catheter. Each strain was examined using five identical models. The method was then repeated using a silicone catheter impregnated with rifampicin, sparfloxacin and triclosan, to determine the effect this had on *P. mirabilis* migration.

**Results:** Despite differences in their motility, 100% of *P. mirabilis* strains migrated along the plain catheter, and there was no significant difference between the rates of movement for each strain ( $p=0.287$ ). In contrast, migration of *P. mirabilis* strains along the antimicrobial catheter was only observed in 8% of models (2/25).

**Conclusion:** These findings suggest that swarming ability is not essential for migration of *P. mirabilis* along the extra-luminal catheter surface. Antimicrobial impregnation significantly inhibited movement of *Proteus* along the catheter ( $p<0.05$ ). The small increases in minimum inhibitory concentration of the antimicrobials were not thought to be clinically important. Future research should investigate the ability of this novel catheter to prevent migration of *P. mirabilis* along the intra-luminal surface.



## 8. Continuous Glucose Monitoring Systems and the Improvement in Hypoglycaemic Awareness Post-Islet Transplantation: A Single-Centre Cohort Study

Clare Flood, Shareen Forbes

**Background:** Islet transplantation is an NHS-funded procedure introduced to the UK in 2011 for patients with the most severe type 1 diabetes mellitus (T1DM). These particular patients have unstable blood glucose, frequently occurring episodes of severe hypoglycaemia and impaired awareness of hypoglycaemia (IAH).

**Objectives:** To evaluate the effectiveness of islet transplantation in improving glycaemic control, reducing the burden of hypoglycaemia and improving awareness of hypoglycaemia through a single-centre cohort study at the Royal Infirmary of Edinburgh.

**Methods:** A retrospective analysis of data collected over three years from the 16 patients who have undergone islet transplantation in Scotland. Glycated haemoglobin (HbA<sub>1c</sub>) was measured and Continuous glucose monitoring systems (CGMS) were utilised to assess glycaemic control, while Gold and Clarke score questionnaires tested IAH.

**Results:** Glycaemic control significantly improved, as illustrated by percentage time in hypoglycaemia in the months following transplant ( $p=0.0211$ ) and HbA<sub>1c</sub> ( $p=0.0426$ ). Improved Clarke ( $p=0.0034$ ) and Gold ( $p=0.0001$ ) scores indicate improved glycaemic awareness following transplant.

**Conclusion:** Our observations in 16 patients suggest that in selected patients, islet transplantation can be a life-changing procedure capable of improving glycaemic control and IAH in select patients with a history of frequent and severe hypoglycaemia. Data can be collated with that from other UK centres to increase statistical power and establish statistical significance for correlation statistics.

## 9. Mesh Overlap Requirements for Hernia Defect Repair

Mathew Lyons, Helen Mohan, Des C Winter, Ciaran K Simms

**Background:** Abdominal wall hernia is a common problem and mesh repair has been shown to reduce recurrence compared to primary suture repair. However, there is limited data on the optimal mesh overlap ratio for repairing defects, and current practice suggests using a mesh with a 50mm overlap regardless of defect size. The risk of recurrence is likely to be higher if mesh size is under-estimated, while excess mesh may lead to adhesions. No study has examined the mesh overlap required relative to defect size based on a biomechanically informed model.

**Methods:** This study used a biomechanical model, validated using a small observational study, to investigate mesh overlap requirements for defect closure. Circular defects from 10- 50mm were created in porcine abdominal walls and closed using meshes ranging in diameter from 20-100mm, tacked in place using a laparoscopic tacker. Intra-abdominal pressure (IAP) was replicated within the biomechanical rig using compressed air and increased until the surrogate intestine material extruded through the defect indicating mesh failure. 53 successful tests were conducted generating a formula relating defect size to required mesh size.

**Results:** There is a quadratic relationship between mesh size, defect size and failure pressure. For simplicity of application, this relationship has been simplified to a linear approximation and the mesh diameter used in ventral hernia repair should be at least twice the defect diameter, plus 25mm, to adequately prevent hernia formation up to an IAP of 20kPa.

**Conclusion:** Current practice of using a 50mm overlap in all cases leads to low recurrence rates, but is overestimating the mesh size required for small defects. More importantly, it appears to underestimate the mesh overlap required for large hernia defects, which could partially explain the higher rate of recurrence for those defects. This ex-vivo evaluation of mesh overlap is the first to challenge the current empirical practice of using a mesh overlap unrelated to defect size.

## 10. An analysis of participation in the governing bodies of the WHO Framework Convention on Tobacco Control, with reference to national tobacco control strength

Paula Glancy, Evgeniya Plotnikova, Jeff Collin, Sarah Hill.

**Background:** If the global tobacco epidemic is to be successfully controlled, effective engagement of all nations with the Framework Convention on Tobacco Control (FCTC) is essential. A key means of engagement is through FCTC governing bodies, within which all decisions regarding this treaty are made. However, recent studies have identified that certain countries face challenges in effectively participating within these meetings.

**Aims:** This study aims to examine the extent to which the strength of national tobacco control correlates with participation in the governing bodies of the FCTC.

**Methods:** Data from the 2011 MPOWER report on the global tobacco epidemic was used to develop three markers of tobacco control strength -taxation level, smoke-free coverage and marketing bans. A composite measure of tobacco control strength, combining taxation, smoke-free coverage and marketing bans, was also developed. Lists of participants from twelve FCTC governance meetings were obtained, and representation compared with need for stronger national tobacco control measures.

**Results:** Nations with weaker tobacco control were found to be consistently under-represented within FCTC governing bodies. Countries within this group were more commonly represented by single-person delegations, and constituted the majority of absent parties in all twelve meetings. Conversely, nations with strong implementation were dominant within these decision-making fora.

**Conclusion:** Nations facing the greatest challenges in effectively implementing the FCTC also face significant barriers to effective participation within its governing bodies. Supporting their participation – particularly in the context of declining participation – is imperative if the decision-making processes of the FCTC are to be responsive to tobacco control challenges which these nations face, and the threat to health minimised.

## 11. Evaluating the accuracy of clinical foetal weight estimation by clinicians at Christian Medical College (CMC) Hospital, Vellore, India; a clinical audit

Aarati Susan Mathew, Radhika Patel, Jiji Mathew

**Background:** Foetal weight is an important predictor of foetal wellbeing and neonatal complications during labour and the puerperium. Therefore, estimating foetal weight prior to delivery can be useful in predicting the progression of labour and identify complications to prepare staff for optimum delivery. Although clinical palpation (Leopald's manoeuvre) is deemed to be less accurate than ultrasoundography, it is more practical in resource poor settings.

**Aim:** To determine how accurately clinicians at CMC, a tertiary centre hospital, can estimate foetal weight using clinical palpation on admission of labour. Accuracy was determined as being within 10% of actual birthweight. The null hypothesis was that there is no statistically significant difference between clinical estimated foetal weight (EFW) and actual birthweight.

**Methods:** Data was collected from across three postnatal wards on the 14th August 2014. Selection criteria included singleton pregnancy and an EFW recorded in the notes on admission. The EFW was compared to actual birthweight to calculate percentage error. Patient demographics data such as maternal age, gravida, parity, BMI, blood pressure, maternal pulse foetal heart rate and gender of the newborn were also noted. The total sample size was 98.

**Results:** There is a strong positive correlation between EFW and actual birthweight ( $r=0.904$ ) suggesting the null hypothesis to be true ( $p<1$ , 95% CI  $-0.12<p<0.4$ ). Term deliveries ( $\geq 40$  weeks) in the normal actual weight range (2500-4000g) had a 59.5% estimation accuracy ( $n=74$ ) compared to pre-term ( $<40$  weeks) with an estimation accuracy of 0% ( $n=2$ ). Out of the term deliveries, macrosomic babies ( $>4000g$ ) were underestimated by 25% ( $n=3$ ) and low birthweight babies were overestimated by 12.7% ( $n=9$ ).

**Conclusion:** Registrars who estimated foetal weight were accurate in babies within normal weight ranges. However, there needs to be an improvement in predicting weight of macrosomic and low birthweight foetuses. We have suggested the use of an amended version of the Johnson's formula for the Indian population for improvement and a need to re-audit once implemented.

## 12. Determining The Relationship Between Burden Of Deviations Of Cerebral Tissue Oxygenation and Adverse Outcomes In Preterm Infants

Isabel Hui-Xuan Ng, Cristine Sortica da Costa, Gordon Stevenson, Topun Austin

**Background:** Decreased cerebral perfusion is associated with brain injury in preterm infants. Management targeting cerebral oxygenation requires thresholds of cerebral tissue oxygenation to be defined. This study investigates the relationship between deviations of cerebral tissue oxygenation beyond set thresholds and outcomes of mortality and intraventricular haemorrhage (IVH) in preterm infants.

**Methods:** 49 preterm infants born at median (range) gestational age of 26+6 weeks (23+4 – 31+0) were studied at a median (range) age of 11.7 (3.5-64) hours of life. Cerebral tissue oxygenation index (TOI) was measured using a NIRO200NX spectrophotometer and data were stored and analysed using ICM+ software. We investigated thresholds of TOI of 55%, 60% and 65%. Cumulative burdens of hypoxia were calculated in 6 hour windows in 26 infants who were continuously studied for a median duration of 43 hours.

**Results:** Of the 49 infants, 8 died and 19 had IVH (grades 1 to 4). Burden of hypoxia was defined as the magnitude of deviation multiplied by duration of time outside the thresholds. Logistic regression analysis showed significant association between all burdens of hypoxia and outcomes ( $p < 0.05$ ). Mann Whitney U test was used to compare mean cumulative burdens of hypoxia between infants with and without IVH. Significant difference was found from 24 hours of life and beyond ( $p < 0.05$ ).

**Conclusion:** We demonstrated thresholds of TOI where significant associations between burden of hypoxia and adverse outcomes of mortality and IVH were observed. Therefore, burden of TOI deviation may be a useful clinical index, especially in the first days of life of preterm infants.

### 13. Isolation of a Potentially Novel Antimicrobial Compound With Gram-Positive And Gram-Negative Activity From The South American Frog Species *Phyllomedusa Sauvagii*

Dan Murray, Gordon Cooke, Chris Watson

Antimicrobial resistance in bacteria is one of the most critical global public health concerns of our time. Emerging strains of resistant pathogenic bacteria have necessitated a deeper search for novel antimicrobial agents to which these microorganisms have not yet been exposed.

Antimicrobial peptides (AMP's) are short, usually cationic and amphiphilic  $\alpha$ -helical proteins which have been shown to have activity against a broad range of bacteria, viruses and fungi. AMP's are part of the innate immune response and are ubiquitous in nature, having already been isolated from such diverse sources as plants and ocean sediment, as well as from all manner of invertebrate and vertebrate creatures from spiders and scorpions to humans and frogs.

Our research aimed to assess unfractionated and fractionated secretions from three distinct species of frog and measure their potential antimicrobial activity against a variety of bacterial species (both Gram-positive and Gram-negative), and to further characterise the most active fractions. Tests were carried out using agar diffusion assays and bacterial growth curves followed by toxicity studies on human B lymphocytes using flow cytometry. Two particular fractions from the Waxy Monkey Leaf Frog (*Phyllomedusa Sauvagii*) were identified as having strong antibacterial activity, and were found not to be toxic to B lymphocytes.

We report the discovery of a potentially novel AMP which has been shown to be active against both Gram-positive and Gram-negative bacterial species, with no apparent apoptotic effects on human B lymphocytes. Further characterisation of this peptide, including mass spectrometry analysis, is ongoing.

## 14. Beliefs about Autism amongst Somalis in the UK

Farida Hassan

**Background:** The increased rates of diagnosis of autism among migrant communities such as Somalis are an increasing challenge in Global Health and it is also challenging for the communities who may not have encountered the medicalization and diagnosis of pervasive developmental disorders. This study examined the beliefs and behaviours of the mothers of Somali children diagnosed with autism in London.

**Methods:** 5 groups comprising of 10 Somali women in London were selected and asked a series of both open and closed questions in a questionnaire during focus group concerning their beliefs about the cause of autism and how they believe they are coping.

**Results:** 50 Surveys were completed. 70% (n = 50) believed that the MMR vaccine was the cause of their child's autism. 56% believed that change in environment (particularly weather and genetically modified food and) was involved, and 58% thought that Autism spectrum disorder did not exist in Somalia. Many women had negative feelings towards raising a child with impairments, and many had a pessimistic view of the support they are given by the school and their General Practices.

**Conclusion:** The results of this study show that the increased rates of diagnosis is something which is perceived negatively by the Somali community, leading to health behaviours such as avoidance of vaccination and a bad view of care services in the UK. More focus groups and support for these women would certainly improve outcomes for the families by providing better education using health professionals who speak Somali and have an understanding of the culture. To further this research, a case control study on the prevalence of Autism to Somali women versus non Somali migrants in the UK is proposed.

## 15. Improving heart failure outcomes in ambulatory and community care: a scoping study

Ying-Ju Ruby Chang, Lorraine Jensen, Sarah M Troster, Kimberly Cai, Avram Shack, Dorothy Wang, Ji Soo Kim, Diva Tural, Arlene S Bierman

**Background:** Heart failure (HF) is a chronic disease of increasing prevalence in our aging population. To meet the needs of this complex group of patients effective on-going management systems are needed. A scoping review was conducted on organizational interventions for HF patients in ambulatory care settings.

**Methods:** Using the method of Arksey and O'Malley (2005), searches (2004-present) were conducted in Medline, the Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effects and the AHRQ Innovations Exchange. Included studies were published in English, of patients > 19 years.

**Results:** Of the 2565 relevant articles found, 52 records met the selection criteria. These were then summarized under the following categories:

*Multicomponent interventions* reduced hospitalization, readmission and mortality, and improved quality of life. Consistent features related to positive outcomes were associated with interdisciplinary teams, discharge planning and follow-up, patient education and counselling, optimization of medical therapy, and telephone support.

*Self-management* support improved self-care behaviour, disease knowledge and management, and quality of life. Less effect on hospital readmission and mortality was observed. The contribution of self-management was difficult to determine, as it is often a component of a disease management program.

*E-health applications*, specifically telemonitoring, decreased hospitalization rates and emergency department visits, increased patient confidence in disease self-management. Evidence for other e-health interventions was unclear.

**Conclusion:** Through the scoping review, evidence for effective practices to improve quality and outcomes of HF care were identified. However, applications of the findings are limited due to heterogeneity in patient, practitioner, and study design, and a lack of important information on intervention delivery and fidelity. In order to devise a high quality HF intervention that is scalable and adaptable, standardized design and reporting of intervention studies is needed in the future to produce more generalizable evidence to inform HF care practice.



## 16. Does maternal obesity prior to and during pregnancy have a detrimental effect on the neurodevelopment of the child?

Kathryn Yang

**Background:** With more than a fifth of pregnant women in the UK either overweight or obese, the steady increase over the past decade is a health concern that contributes to both adverse birth and childhood consequences for the developing child. This is becoming an issue in developing countries as well as developed. Previous research has monitored relationships between an increase in weight gain during pregnancy and multiple diseases that can be observed early on in the offspring and later in life. Recent studies have targeted neurodevelopmental delays specifically as a detrimental outcome of maternal obesity.

**Objective:** The aim of this review is to systematically analyse published literature looking at the correlation between neurodevelopmental outcome and maternal body mass index (BMI). This will help ascertain whether or not these findings are significant.

**Methods:** Six databases were used to search up several key terms, including maternal BMI and neurodevelopmental delay. Papers were not excluded by year of publication and the search was performed on February 20th, 2014. The title, abstract and full text were screened for papers based on inclusion and exclusion criteria. Inclusion criteria included: pregnant women with a BMI  $\geq 30$  kg/m<sup>2</sup>, use of an observational approach, and publications in both high and low- income nations. Studies were restricted to English language.

**Results:** From the 791 studies initially identified, 15 remained after the final screening. They were all categorized according to their targeted outcome: delayed intellectual development, behavioural abnormalities and psychiatric disorders. All the studies except for three found a positive correlation between exposure and outcome.

**Conclusion:** The lack of causal evidence due to the observational nature of each paper prevents the author's conclusions from being definitive. While there is definitely a distinct link between maternal BMI and the child's neurological outcome, further research using experimental designs must be conducted.

## 17. Investigation of the effect of cigarette smoke on proliferation and growth of human dermal fibroblasts, and secretion of matrix metalloproteinase 2 (MMP-2)

Dimitrios Karponis, Ioannis Bonovolias, Elina Papakonstantinou

**Background:** Human dermal fibroblasts (HDFs), found in the dermis layer, are specialized cells responsible for the production of connective tissue and skin repair. Tissue degradation is mediated by matrix metalloproteinases (MMPs), a family of proteases associated with metal ions (i.e. Zn<sup>2+</sup>). MMPs are inhibited by tissue inhibitors of metalloproteinases (TIMPs). Therefore, skin remodelling relies of the balance between MMP and TIMP activity.

**Objective:** The aim of this study was to investigate whether incremental concentrations of cigarette smoke along with time exposed to cigarette smoke, affect the viability and proliferation of HDFs, as well as the activity of MMP-2 secreted by the cells.

**Methods:** Cultured HDFs were exposed to different concentrations (0%-control, 10%, 20%, 40%) of cigarette smoke extract (CSE) diluted in RPMI medium. Cultures were incubated for 24 and 48 hours. Thereafter, Neubauer plate-assisted microscopic counting of cells was performed to quantify cellular proliferation. Staining with Trypan blue followed, revealing HDF viability in different CSE concentrations. Finally, gelatin zymography was conducted to measure MMP-2 activity.

**Results:** Findings indicate that CSE concentrations of 20% and higher produce a noticeable reduction in HDF viability. The effect becomes more severe with prolonged exposure (48 hours). An intermediate state is also observed, characterized by aberrant HDF shape. Furthermore, the activity of MMP-2 is stimulated by CSE in a dose-dependent manner.

**Conclusion:** In conclusion, CSE is associated with the degradation of skin tissue. The results yield support to the interference of cigarette smoke chemicals with the MMP- TIMP equilibrium. This demonstrates that active smokers are at high risk of premature skin ageing.

## 18. Ebola Management: Emphasising inequalities

Benjamin Clayton, Harriet Nicholas, Sophie Scott, Ellen Wakefield

**Background:** As the Ebola outbreak in West Africa continues to provoke international concern, a large amount of money is being invested in increasing the production of experimental drug therapies and vaccines. Despite this, supplies are likely to remain limited for the immediate future.

**Methods:** We performed a literature review on current ethical guidelines behind scarce resource allocation during epidemics. We subsequently analysed current reports emerging from the actors involved in managing the Ebola crisis in West Africa

**Results:** Examining the current use of experimental drugs on Ebola patients has highlighted inequalities between high and low income countries. This appears to go against the World Health Organisation's (WHO) ethical principles of equity and utility for allocation of scarce resources. As drug production gathers pace, discussion must now focus on how best to ration future treatment. Several parties, including the WHO, have advocated the prioritisation of healthcare workers. Although this has several advantages, severe ethical and practical objections remain. Not least among these is the inequality created between an already disproportionately privileged group (healthcare workers) and the rest of the population. In addition, poor healthcare systems in West Africa have already hampered the race to control the virus and will complicate the introduction of any future treatment.

**Conclusion:** As the virus continues to spread, it remains vital that any decision must not only be effective, but also ethically justifiable to those with the greatest burden of Ebola.

## 19. An analysis of industry engagement with evidence in responses to the 2012 Consultation on delivering the Government's policies to cut alcohol fuelled crime and anti-social behaviour

Katherine Sarah McClure

**Background:** An ongoing debate ensues over whether funding from alcohol companies should be accepted for research into alcohol control measures. Given the UK Coalition Government's recent commitments to the pursuit of evidence-based policy, the necessity for robust scientific research on alcohol policy is essential if public health goals in relation to reducing alcohol-related harm are to be realized.

**Aim:** This project aims to investigate corporate sector involvement in alcohol policy research within policy debates around minimum unit pricing (MUP) of alcohol.

**Methods:** A literature review was carried out firstly into the evidence that exists around alcohol control policies, focusing on MUP, and secondly to explore how the alcohol industry engages with scientific research. Subsequently, content analysis of industry submissions to the consultation on MUP was undertaken with a focus on respondents' engagement with evidence.

**Results:** The literature review revealed that MUP is one of the most effective policies in lowering alcohol-related harm, and found that corporate actors in the alcohol industry become involved with public health research through funding studies, funding research organizations, and attempting to undermine or misrepresent independent academic research. These strategies were also identified in the analysis of submissions to the Coalition's consultation on MUP.

**Conclusion:** This project finds that the alcohol industry engages with evidence on numerous levels in attempts to influence policy decisions in favour of its commercial incentives. This report contributes to the debate on alcohol industry funding of research by advocating for minimal involvement of corporate actors within public health science.

## 20. The adverse drug events associated with mycophenolatemofetil treatment in paediatric renal transplantation at a UK tertiary children's hospital

Busra Nalbant, Louise Oni, Allison Birch, Caroline Jones

**Background:** Mycophenolate Mofetil (MMF) is used as a key agent in immunosuppression regimens following renal transplantation. The use of combined immunosuppressant regimens that include MMF has allowed the early withdrawal of steroids. MMF generally has good tolerability and the most common adverse effects are abdominal pain, nausea and diarrhoea.

**Objectives:** The aim was to undertake a clinical service review of the adverse drug reactions of MMF in paediatric renal transplant patients in a large tertiary children's hospital.

**Methods:** Children attending Alder Hey Hospital who received MMF in their immunosuppression regimen following renal transplantation over a 9-year period were identified. The computerised system and patients' medical case notes were used to gather information. Data was collected at specific time intervals: every 2 months until 1 year, and then annually.

**Results:** The study identified 29 patients. Anaemia was seen in 76% of patients in the first 2 months decreasing to 8.3% of patients by 48 months post-transplant. Neutropenia peaked at 4 months (37% of patients) and decreased until 12 months to 4.8%. 40% of patients initially had elevated LFTs that declined to 8.3% of patients at 48 months. Amylase levels increased after 12 months from 5.3%, peaking at 72 months. One patient (3.4%) developed PTLD. No patients had bronchiectasis. Six patients (20.7%) had MMF reduced or stopped due to adverse drug reactions that included hair loss, deranged LFTs, anaemia, recurrent urinary tract infections and PTLD.

**Conclusion:** We found that adverse drug reactions that may have been attributed to MMF were common and many decreased with time. Limitations include its retrospective nature and that patients were taking other medications that could be responsible for the adverse reactions noted. Larger, multicentre studies are recommended with a longer follow up, to establish whether the drug reactions are transient or chronic.

## 21. A comparison between intratympanic gentamicin and intratympanic steroids for controlling vertigo in Ménière's disease

Matthew Birch, Shadaba Ahmed

**Background:** The symptoms of Ménière's disease (MD) were first described together in the mid 1800's. Despite the disease being recognised for over 150 years, the exact cause is still unknown. Treatment aims to reduce endolymphatic pressure. When conservative treatments fail more invasive treatments can be utilised. This paper aims to review the efficacy of intratympanic gentamicin (ITG) and intratympanic steroids (ITS) and compare them in controlling vertigo, as few studies offer such a comparison between the two treatments. The conclusions aim to guide clinical practice.

**Methods:** A search of the database PubMed and the Cochrane Library was performed from 2000 onwards to identify the relevant literature, in English, relating to intratympanic gentamicin and steroid administration in humans with MD. The search terms "intratympanic and Ménière's disease", "intratympanic treatment vertigo", "intratympanic gentamicin", "intratympanic steroid Ménière's", "intratympanic dexamethasone" were used. Once relevant papers had been identified the references were searched for any other relevant studies that the database searches had not yielded. Only studies from 2012 onwards were included to give an accurate representation of the latest practices.

**Results:** 4 papers studied the effects of ITS, 9 papers studied ITG and 2 papers directly compared the 2 treatments. Study designs varied from meta analyses and double blind, randomised, placebo controlled trails to prospective and retrospective cohort studies. There appears to be little consensus on treatment regimes for both treatment modalities, varying from fixed daily protocols to an "as needed" basis. Dosing strategies varied from 4mg/ml to 12mg/ml and 20mg/ml to 27.6mg/ml for ITS and ITG respectively.

**Conclusion:** Both ITG and ITS appear effective in the treatment of MD. ITG appears more effective than ITS, but is associated with more side effects. 26.7mg/ml ITG with a minimum of 1 month between injections or at 1-3-6-12 months appear to be the most effective regimes and associated with minimal risks. 12mg/ml ITS (dexamethasone) on a 'as needed' basis appears to be an effective regime in controlling symptoms long term, with few side effects.

## 22. The Role of the World Health Organization in Combatting Epidemics: the Ebola Crisis and Lessons Learned

Lauren McGivern

**Introduction:** The World Health Organization (WHO) is part of the United Nations and addresses international public health. The WHO has been criticised for its handling of global health crises, most recently for its delayed and ineffectual response to the Ebola outbreak in West Africa. In my presentation, I propose to address the role of the WHO in managing the Ebola outbreak in 2014, and review the criticism it received. Finally, I will analyse and discuss the lessons learned by the WHO after its mismanagement of the Ebola crisis.

**Methods:** On 25 January 2015, the WHO Executive Board held a rare special session in order to address the weaknesses identified in its response to the Ebola crisis. The Executive Board unanimously passed a resolution intended to improve its ability to respond to future global health emergencies. I would review the results of this special session, as well as the criticism of the WHO for its lacklustre and disorganised response to the Ebola outbreak. I would also interview at least one WHO official and one Professor of Epidemiology at the University of Edinburgh.

**Results:** Through my research and my interviews, I will be able to discuss both the reasons for the WHO's failure to respond to the Ebola crisis in an efficient and organised manner and the ways by which the WHO intends to address the critical problems that led to its failure. Furthermore, I will discuss whether the WHO's recommendations adequately respond to and address the criticisms of the WHO's handling of the Ebola crisis.

**Conclusion:** Based on my review of the WHO Board's recommendations, as well as the interviews I will conduct, I will assess and discuss whether the WHO is likely to succeed in overcoming its weaknesses and will be capable of managing global health crises more efficiently in the future.

## 23. Physiological basis for anti-arrhythmic actions of flecainide in catecholaminergic ventricular tachycardia

Karthik H Chandrasekharan, Daniel IG Jafferji, Samantha C Salvage, James H King, Laila Guzadhur, Hugh R Matthews, Christopher LH Huang, James A Fraser

**Background and Aims:** Atrial fibrillation (AF), has a 2010 worldwide prevalence of ~33.5 million with ~5 million new cases/year. Its prevalence increases with ageing, from 0.7% to 17.8% between ages 55- 59-years and >85-years. AF predisposes to cerebrovascular morbidity and mortality, increasing risks of stroke fivefold, accounting for 5.7 million hospital bed-days and a direct £2.2 billion NHS cost in 2008. Its underlying physiology remains poorly understood compromising both prevention and treatment. Recent reports described anti-arrhythmic effects of the Class Ic agent flecainide in human catecholaminergic ventricular tachycardia (CPVT), a condition associated with gain-of-function cardiac ryanodine receptor (RyR2)- Ca<sup>2+</sup>channel mutations. Further reports implicated decreased conduction velocity resulting from Na<sup>+</sup>channel downregulation in atrial and ventricular arrhythmia associated with murine, *RyR2-P2328S* hearts, now a scientific exemplar for AF. My experiments studied effects of flecainide in isolated superfused WT and *RyR2-P2328S* left atrial preparations using a novel in situ loose-patch clamp technique.

**Methods and Results:** Peak currents from 20-120 mV depolarising steps increased in 10 mV increments gave current-voltage activation curves described by maximum currents, *I*<sub>Na</sub>, maximum steepnesses, *k*, and half-maximum voltages, *V*<sup>\*</sup>. *RyR2-P2328S* showed smaller *I*<sub>Na</sub> than WT. *I*<sub>Na</sub> decreased with increasing [flecainide] in WT yet paradoxically increased with (1 μM) flecainide in *RyR2-P2328S*; *k* was constant throughout. Studies of *I*<sub>Na</sub> inactivation by 0–95 mV depolarising pre-pulses increased in 10 and finally 5 mV increments similarly demonstrated larger *I*<sub>Na</sub> in WT than *RyR2-P2328S*. Whereas both 1 and 5 μM flecainide decreased *I*<sub>Na</sub> in WT, flecainide (1 μM) paradoxically increased *I*<sub>Na</sub> in *RyR2-P2328S*.

**Conclusion:** Flecainide thus paradoxically rescues the compromised *I*<sub>Na</sub>, recently implicated in arrhythmic substrate in *RyR2-P2328S* in contrast to its expected *I*<sub>Na</sub> reduction in WT. These findings suggest a mechanism in which flecainide reduces the abnormal Ca<sup>2+</sup>release implicated in the *I*<sub>Na</sub> downregulation that produces arrhythmic substrate in *RyR2-P2328S* suggesting a new approach to therapeutic application.



## 24. Ouabain inhibits H<sub>2</sub>O<sub>2</sub>-induced and lipopolysaccharide-induced vasorelaxation in porcine isolated coronary arteries

Lucy C Hare, Michael J Garle, Michael D Randall

**Background and Aims:** Nitric oxide (NO), prostacyclin (PGI<sub>2</sub>), and endothelium-derived hyperpolarizing factors (EDHFs) induce endothelium-dependent vasorelaxation. Previous literature is inconclusive regarding the identity of EDHFs and their role in pathological states. In this study it was investigated whether hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is an EDHF, and whether H<sub>2</sub>O<sub>2</sub> or 3Na<sup>+</sup>/2K<sup>+</sup>-ATPase pumps mediate endotoxic shock. The hypothesis was that lipopolysaccharide (LPS)-induced vasorelaxation in precontracted porcine coronary arteries (PCAs) is inhibited by ouabain over four hours.

**Methods:** PCA segments, in a wire myograph, were precontracted using 9,11-dideoxy-9 $\alpha$ ,11 $\alpha$ -epoxymethanoprostaglandin F<sub>2</sub> $\alpha$  (U46619) (1 $\mu$ M-80nM). H<sub>2</sub>O<sub>2</sub> (10 $\mu$ M-1mM) or sodium nitroprusside (SNP) (1nM-30 $\mu$ M) were added, with various inhibitors, and cumulative concentration-response curves were created. Other experiments measured the effect of *Escherichia coli* LPS, and various inhibitors, on PCA tone over four hours.

**Results:** H<sub>2</sub>O<sub>2</sub> caused concentration-dependent vasorelaxation; the percentage relaxation of U46619-induced tone by 300 $\mu$ M H<sub>2</sub>O<sub>2</sub> was 42.6  $\pm$  15.3% (mean  $\pm$  SEM) greater (p<0.05) than controls (n=5). H<sub>2</sub>O<sub>2</sub>-induced vasorelaxation was unaffected by K<sup>+</sup> channel inhibitors, but abolished (p<0.05) by 500nM of the 3Na<sup>+</sup>/2K<sup>+</sup>-ATPase pump inhibitor ouabain (n=6). However, 500nM ouabain did not abolish (p<0.0001) the vasorelaxation produced by 30 $\mu$ M SNP (n=6). 5 $\mu$ g ml<sup>-1</sup> LPS also caused vasorelaxation; the relaxation of U46619-induced tone after four hours was 49.9  $\pm$  12.0% greater (p<0.01) than controls (n=6). This was reduced (p<0.05) by 72.2  $\pm$  23.1% by 500nM ouabain (n=8), but, like resting tone, was unaffected by 1000U ml<sup>-1</sup> catalase.

**Conclusion:** Overall, it is unlikely that H<sub>2</sub>O<sub>2</sub> is an EDHF in PCAs because, although H<sub>2</sub>O<sub>2</sub> produced ouabain-sensitive vasorelaxation, it did not activate K<sup>+</sup> channels or mediate resting PCA tone. It is also unlikely that H<sub>2</sub>O<sub>2</sub> mediates LPS-induced changes in PCA tone. However, 3Na<sup>+</sup>/2K<sup>+</sup>-ATPase pumps did mediate LPS-induced PCA hyporesponsiveness. Therefore, 3Na<sup>+</sup>/2K<sup>+</sup>-ATPase pumps could be useful targets in treating endotoxic shock in the future.

## 25. A systematic review of the standards of clinical audits in UK hospitals

Eunkyung Lee, Conrad Lee, Michael George

**Background and Aims:** Clinical audits were introduced into the NHS to monitor and improve healthcare quality. Participation in clinical audits is mandatory for healthcare professionals. Re-auditing is a key element for the completion of audit cycles and determines its success. This systematic review analyses published reports of clinical audit assessments in UK hospitals within the past two decades, to assess their overall quality and audit cycle completion rates, and to identify key elements that facilitated the production of a successful audit.

**Methods:** A literature search was conducted on EMBASE, MEDLINE, CINAHL, HMIC, TRIP database, Evidence Search, Cochrane Library and Google Scholar using keywords "audits", "audit of audits", "completion rate" and "hospitals" for years between 1994 and 2014. An additional handsearch of the indexes from relevant publications was done for additional key papers. Only UK studies relevant to the research question were included for further review.

**Results:** Of the 1029 search results, 12 relevant publications were reviewed. 877 clinical audits were analysed. Only 147 audit projects (17%) have been completed with an audit cycle. 138 out of 283 audit projects (49%) led to implementation of action plan. A number of recommendations have been made to improve the clinical audit programmes such as: audit training, careful planning of audit projects, involvement of the local audit department and senior staff, multidisciplinary approach, adequate handing over of projects to junior staff, and periodical audit reviews.

**Conclusion:** Low completion rate is a major concern for the effectiveness of clinical audits across NHS hospitals. Not only does this lead to valuable time and resources being wasted, the educational and core value of clinical audits are also jeopardised. There are considerable variations in audit programmes across the NHS. Evaluation of local clinical audit practice is therefore highly recommended in consideration of improving local audit monitoring and support process.

## 26. Evaluation of the B Pro watch and Dinamap cardiovascular monitors

Whajong Lee, Tarun Jacob, Vince Wilson

**Objective:** The BPro watch is an ambulatory blood pressure monitoring (ABPM) device that utilises a tonometer, differentiating it from conventional oscillometric monitors such as the Dinamap compact T model. With ABPM becoming a vital part of hypertension diagnosis, by comparing the two machines this study will evaluate the clinical potential of the BPro watch.

**Methods:** Cardiovascular measurements were taken from 11 subjects in synchrony between the B Pro machine and the Dinamap Compact T model over a period of two and a half hours. To analyse the comparative data between the machines the Bland Altman statistical test was used. The volunteers were then sent to retrieve recordings of cardiovascular factors over a period of 24 hours. NICE guideline requirements for diagnosing hypertension by an ABPM device were used to assess the B Pro machine's capabilities in this role.

**Results:** The Dinamap and B Pro showed 95% limits of agreements of -42.41 to 17.54 for SBP, -34.06 to 7.930 for DBP and -30.39 to 26.73 for heart rate. With large ranges in the limits of agreements, the machines failed to show significant correlation in the Bland Altman statistical tests for all three cardiovascular factors. The BPro watch's 24 hour data only succeeded in meeting one of the two NICE guidelines requirements for diagnosis of hypertension by ABPM.

**Conclusion:** The BPro and the Dinamap gave discrepancies to an extent greater than the 95% limits of agreement that represented significant correlation between machines for systolic BP measurements (-5.41 to 4.59), shown by the Williams, et al. (2011) study. With such surprising discrepancies, further studies comparing both machines to 'gold standard' methods of cardiovascular monitoring is recommended. Further research in the B Pro machine's reliability as an ABPM machine as laid out by NICE guidelines is also recommended.

## 27. The risk assessment and management of venous thrombo-embolism (VTE) in pregnancy: an audit against current Newcastle upon Tyne Hospitals Trust (NUTH) and Royal College of Obstetricians and Gynaecologists (RCOG) guidelines

Lotte Elton, Philippa Marsden, Frances Lamb

**Background:** Pregnancy is a known risk factor for venous thrombo-embolism (VTE), which occurs in 1 in 1000 pregnancies. Pulmonary embolism is the leading direct cause of maternal death in the UK, yet with appropriate prophylactic treatment many pulmonary embolisms are preventable. NUTH undertakes a VTE risk assessment to identify women in need of thromboprophylaxis, but recent RCOG guidelines (Green-top No 37a.) suggest additional risk factors e.g. parity >3.

**Aims:**

- Assess whether all women diagnosed with an ante-natal or post-natal VTE in an 18 month period were risk assessed and managed correctly as per NUTH guidelines.
- Identify whether any women would have been risk assessed or managed differently had RCOG guidance been followed.

**Methods:** All women who had a confirmed or suspected VTE during pregnancy or post-natally from July 2013 - December 2014 were identified from the Obstetric Haematology database. Retrospective analysis of these patients' case-notes against the standards was then performed.

**Results:** 16 women had an ante-natal VTE and 10 women had a post-natal VTE during the audit period: a higher incidence than expected. 5 women had no documentation of risk assessment, 4 of whom had been booked at a different trust. NUTH guidelines identified 5 women ante-natally and 2 women post-natally as being at increased risk of VTE, 6 of whom received appropriate thromboprophylaxis. Had RCOG guidelines been followed, 14 women would have been at increased risk and would have received thromboprophylaxis.

**Conclusion:** The lack of risk assessment in cases where women were booked elsewhere highlights a need for risk assessment to be undertaken once care is transferred to NUTH. Following the RCOG guidelines would have resulted in a significant increase in the number of women receiving thromboprophylaxis. The inclusion of criteria such as smoking in RCOG guidelines appears to be particularly useful in identifying women at increased risk of VTE.

## 28. Clinical trial participation in the EB community: A DEBRA Ireland Project

Maeve Jones-O'Connor, Avril Kennan, Amanda McCann

**Background:** Low rates of patient participation threaten the progression of clinical research. This threat is magnified in the context of clinical trials in rare diseases, such as epidermolysisbullosa (EB). The aim of this project was to: investigate patient participation in EB clinical trials (CTs); identify positive and negative factors affecting participation, and recommend ways to overcome them.

**Methods:** An extensive literature review provided the overall context for the project. Interviews (n=12) with leading researchers in the field gave insight into the attitudes of researchers, their experiences and the current research landscape. Online patient surveys (n=43) provided the patient perspective. A report was prepared for DEBRA with recommendations on measures to help improve participation. These follow general themes of: collaboration with researchers; engagement with patients and development of the global EB community.

**Results:** There are major identifiable barriers to patient participation in EB. Some apply to the general population as well, such as: lack of education about clinical research; low awareness of trial opportunities; fear of inherent unknowns in CTs; "free rider" problems. However, EB specific barriers are the most influential; these include: travel issues; numbers of site visits and numbers of invasive procedures. Although fewer in number, the EB- specific issues are ingrained and have not been affected by previous efforts to ameliorate them.

**Conclusion:** This project clearly demonstrated that major barriers to CT participation exist for patients with EB. Encouragingly, it is also clear that the community is motivated to work together to advance research. Stakeholders in the EB community will consider the report, with a view to implementing recommendations.

## 29. A systematic review of outcomes of composite mechanical root replacement compared to biological root replacement

Melissa Bautista, Mohamad Bashir, Matthew Fok, Haroon Mahmood

**Background:** Aortic root dilation with aortic valve disease can potentially progress to rupture or dissection which subjects the patient to a high risk of mortality. Composite root replacement is the procedure of choice for aortic root replacement, achieved with either a biological or mechanical valve. This systematic review analyses the published literature of biological and mechanical composite root replacements in order to compare the postoperative surgical outcomes.

**Methods:** Major medical databases were searched in order to identify papers where composite root replacement was performed. The articles selected were chosen by one reviewer and the relevant data was then extracted.

**Results:** We identified 56 studies that conformed to our inclusion criteria and incorporated 172,914 patients (85,800 mechanical and 3380 biological). In hospital mortality was higher but non-significant in the mechanical group (6.1% Vs 4.2% respectively). Mechanical composite root was associated with a significant increased risk of perioperative bleeding (8.8% Vs 4.1% respectively,  $p < 0.01$ ). There was no significant difference in; endocarditis, 1 year mortality, 5 year mortality, weighted reoperation rates, mean cardiopulmonary or aortic cross clamp time.

**Conclusion:** Mechanical composite root replacement is associated with a significant increased risk of perioperative bleeding and non-significant higher in-hospital mortality when compared to biological composite root replacement.

### 30. A systematic review of valve-sparing aortic root replacement compared to composite replacement

Maxwell Knipe, Mohammad Ahmad, Matthew Fok, Ali Abdelnour, Mohamad Bashir

**Background:** Aortic root dilation represents a potentially life threatening cardiovascular disease. Composite root replacement was the original gold standard for aortic root replacement surgery. Over the past two decades however there has been a movement towards valve-sparing techniques preserving the native aortic valve. This aims to avoid prosthetic valve complications and maintain native valve haemodynamic benefits. We performed a systematic review to compare these two techniques.

**Methods:** A systematic review was carried out on electronic databases to identify all relevant papers with both valve-sparing and composite procedures in their dataset. Articles were excluded if they contained less than 50 patients, or were entirely Marfan's or paediatric populations.

**Results:** A total of 13 comparative papers were identified encompassing 2123 patients (656 valve sparing and 1467 composite). Average age 57.3, male 67.3%, mean follow-up time 4.6 years, Marfan's 10.6%. Perioperative bleeding was significantly higher in mechanical composite group compared to the biological composite and valve sparing groups ( $9.8\% \pm 6.4$  vs  $4.4\% \pm 6.2$  vs  $3.3\% \pm 4.2$  respectively,  $p < 0.01$ ). In-hospital mortality was low and non-significant between all groups. Only one study reported long-term follow up. Reoperation rates were higher in the valve sparing group compared to the composite group (6.7% vs 2.8% respectively), this was non-significant when weighted with follow up.

**Conclusion:** Little difference was found in early post-operative outcomes of the two techniques. Similar hospital mortality rates indicate similar safety profiles. The only notable difference was the association of mechanical composite valves with an increased post-operative bleeding risk. Further research is needed to compare the long term outcomes to see whether they diverge, particularly in terms of reoperation rates.

### 31. Establishing Cardiac Pathological Phenotypes in Mouse Models of Juvenile and Infantile Neuronal Ceroid Lipofuscinosis (Batten Disease)

Jinha Kim, Yewande Pearce, Jonathan Cooper

**Background:** The Neuronal Ceroid Lipofuscinoses (NCLs or Batten Disease) are a group of inherited lysosomal storage disorders recognized as the most common paediatric neurodegenerative condition. Particularly, the juvenile (JNCL) and infantile (INCL) subtypes are associated with the highest prevalence and fastest clinical onset respectively. Recently, evidence has accumulated for the presence of cardiac pathology in NCL patients; shown to be ventricular hypertrophy, fibrosis and conduction defects. There remains, however, a paucity of studies focusing on pathology in the heart. The present study characterizes novel cardiac pathological phenotypes using mice with the aim of aiding the development of combination therapies targeting pathology in the CNS and systemic tissues with greater efficacy.

**Methods:** Wheat Germ Agglutinin, Isolectin B<sub>4</sub> and Picosirius Red staining protocols were used to measure cardiac myocyte size, endothelial cell count and levels of fibrosis in *Cln3*<sup>-/-</sup> and *Ppt1*<sup>-/-</sup> mice in comparison to their Wild Type (WT) control counterparts. This reliably assessed for any ventricular hypertrophy with associated cardiac compensatory responses and interstitial fibrosis respectively.

**Results:** A statistically significant difference ( $p=0.0039$ ) was found for fibrosis in *Ppt1*<sup>-/-</sup> mice compared to their WT controls but no statistically significant difference was found in *Cln3*<sup>-/-</sup> mice. Additionally, no statistically significant differences were found for cardiac myocyte size and endothelial cell count in the diseased models (*Cln3*<sup>-/-</sup> and *Ppt1*<sup>-/-</sup> mice) compared to their WT controls.

**Conclusion:** This study has shown that *Cln3*<sup>-/-</sup> and *Ppt1*<sup>-/-</sup> mice can be used as a reliable model for assessing cardiac pathology in JNCL and INCL respectively. Fibrosis has been identified as a novel pathological phenotype in INCL. This result combined with those of future experiments will be beneficial in providing a complete picture of cardiac pathology in NCL.



## 32. Audit on Whether Guidelines are Followed When Investigating Suspected Pulmonary Embolism

Supria Akhtar Chowdhury

**Background and Aims:** Fatality is a significant risk of pulmonary embolism, however the symptoms may not always be specific to the cause. This makes the investigations leading up to the diagnosis vital. A concern is that many patients undergoing computed tomography pulmonary angiography scan for suspected PE do not undergo other investigations advised by the National Clinical Guidelines. This leads to an overuse of scans, causing a financial burden to the NHS and costing patients. Unnecessary radiation exposure and over diagnosis are costs patients may experience. The aim is to find out whether the guidelines are followed for patients presenting with suspected pulmonary embolism.

**Methods:** An audit has been carried out at a district general hospital. An outpatient log of 16 patients who presented with suspected pulmonary embolism was analysed. This sample was further reduced to 10 patients, as they had full medical notes available. The analysis involved looking at the patients presenting complain and the use of any pre-radiological assessments.

**Results:**

1. There was a lack of pre-radiological assessments such as the Wells Score used.
2. D-dimer tests were ordered for 90% of the patients without a clinician ordering the test.
3. The Wells Score was not used in conjunction with the D-dimer test to assess the need for a scan.
4. In cases of pregnancy the D-dimer test was omitted.

**Conclusion:** It can only be assumed that the Wells Score was not used due to the lack of documentation. This shows poor medical practice as guidelines are not followed, and if they are there is no documentation. The over use of D-dimer tests suggests it may be difficult to follow guidelines as many patients undergo blood tests before a completed clerking. The guideline cannot be followed for pregnant and post-partum patients as they are in a thromboembolic state.

### 33. PROMT (Pre-Hospital Outcome from Major Trauma)

Róisín O'Sullivan, David Menzies, Cliona McGovern

People who die before they reach hospital (pre-hospital) are often excluded from data on the incidences of major trauma (MT). We assess this cohort of people with the objective of identifying the geographical distribution and nature of deaths from pre-hospital MT

A literature review was conducted to identify available data and outcomes on pre-hospital MT deaths. The records of the Dublin City Coroner were searched to perform a retrospective cross-sectional analysis of all pre-hospital MT deaths in Dublin from January 1st to December 31st 2012.

A Geographical Information System (QGIS) was then used to map these deaths against urban deprivation in Dublin City and County.

There were 123 pre-hospital deaths due to MT during 2012 in Dublin.

- The majority of deaths were male (77.24%), most were young (20-<40; 44.63%) to middle-aged (40-<60; 33.06%). Most of these deaths were as a result of hanging (50.41%) or drowning (13.82%).
- 56.91% of all deaths occurred at home.
- Most deaths occurred in areas rated as marginally above average or affluent on the All-Island Deprivation Index Score (53.91%)
- 28.69% of people who died were known to suffer from depression and 26.02% were known to have abused alcohol in their lifetime.
- Alcohol was a contributory factor in 14.63% of deaths while other intoxicants were contributory factors in 7.32%.

The outcomes highlight the demographics, cause of death and socio-economic factors in pre-hospital MT deaths. This may inform future provision of pre-hospital and trauma services.

### 34. Factors contributing to the recent re-emergence and resurgence of communicable diseases in Iraq: What needs to be done?

Sarah Adil Yassen Ali

**Background and Aims:** Iraq has had a tumultuous history in the last few decades which has had a devastating and lasting impact on the country's infrastructure and healthcare system. The re-emergence of polio in 2014, following its eradication in 2000, has become the latest threat. This paper explores contributing factors to the re-emergence and resurgence of communicable diseases in Iraq and the steps needed to improve both vaccination campaigns and coverage rates during times of conflict and pre-emptively in times of relative peace.

**Methods:** This literature review focused on factors deemed instrumental in the rise of polio and measles in Iraq, namely: the multiple sequelae of conflict, parent education and demographics, knowledge and awareness of vaccinations and relevant campaigns and lastly, social infrastructure, including security, utility provision and human resources.

**Results:** The literature pertaining to the sequelae of conflict, showed, as expected, a significant impact on the spread of communicable diseases, vaccination rates and ultimately childhood mortality. Links between levels of parental education, household socioeconomics and vaccination uptake rates were also reported with scope to improve targeted vaccination awareness campaigns. Furthermore, underdeveloped social infrastructure including maintenance of cold storage chains, working conditions for healthcare workers and living conditions, particularly in rural areas, impedes vaccination efforts.

**Conclusion:** The internal displacement and near constant migration of populations within Iraq and across its borders due to conflict poses many challenges to vaccination campaigns. However, this occurs on a background of chronic issues impeding maintenance of adequate vaccination rates amongst the general Iraqi population. Data collection and monitoring systems need improvement, including the greater use of vaccination cards. The development of novel educational campaigns designed to reach the most rural populations is vital in addition to much needed investment in - and development of - social infrastructure, without which any attempts to improve vaccination coverage rates are likely to fail.

## 35. Iron Deficiency: Tip of the Iceberg

Fareeda Sohrabi

**Background:** Iron deficiency is the commonest micronutrient deficiency globally, yet there is little recognition for some of the most staggering effects that can alter the trajectory of an individual's socioeconomic and developmental wellbeing. This article reviews the most current literature from around the world, looking at the effects of iron deficiency beyond the basic sciences and effects of anaemia.

**Methods:** The main effects of iron deficiency can be divided into the most at risk populations: pregnant women, infants/children and working adults. This was used as the basis of the review of the literature, with a special emphasis on the neuro-developmental, cognitive and socioeconomic effects in populations globally.

**Results:** Iron deficiency during the first two years of life leads to suboptimal brain development, behavioural and social functioning of children. Detrimental effects on child IQ and cognition can persist even following iron repletion, which is demonstrated by poorer school achievements. In contrast, there were benefits in iron repletion seen by the improvement in productivity of adults in the workplace. Economically, the estimated losses from the multitude of effects from iron deficiency are significant.

**Conclusion:** When objectively analysing the effects of iron deficiency, it is difficult to exclude confounders such as low socioeconomic or migration status, characteristics which are very common in populations with a high prevalence of iron deficiency, so the assessment of the effectiveness of iron repletion has to be read with caution. It is also clear that the risks of not effectively supplementing pregnant women can have long lasting effects on their offspring. Most of the studies carried out have been particularly informative, but larger studies with longer term follow-up and with standardised iron status measurements are required to make further assumptions about the role iron plays in the lives of most individuals.

### 36. A Study of the Effect of Ankle Foot Orthoses on Gait in Stance Phase in Patients with Cerebral Palsy

Rania Gamil Edris, Weijie Wang, Graham Arnold

The aim of this study was to analyse retrospectively the effect of Ankle-Foot-Orthoses (AFOs) on temporal-spatial gait parameters, kinematic and kinetic data during stance phase at hip, knee and ankle joints in Cerebral Palsy (CP) patients and compare those findings with that of a healthy control group.

33 independent CP patients who were prescribed AFOs and had gait analyses performed while walking both barefoot and with orthoses during the same session were identified. In addition, 33 healthy children whose barefoot data was recorded in the same laboratory were included as control group. Gait trials were reviewed, data was extracted at five defined points of stance phase: initial contact (IC 2% Stance), loading response (LR 11% Stance), mid- stance (Mst. 35% Stance), terminal stance (Tst. 65% Stance) and pre-swing (Psw. 90% Stance) and statistical analysis was performed.

There were significant increase in step length ( $p < 0.001$ ), stride length ( $p < 0.001$ ) and walking speed ( $p = 0.002$ ) in CP patients with AFO. Ankle angle and moment showed significance difference at Mst and Tst but the most apparent improvement was observed in ankle moment at LR ( $p < 0.001$ ). There was a significant reduction of ankle power at Psw ( $p < 0.001$ ) that confirms previous studies finding of impaired push-off with AFO. Minimal changes were detected within knee parameters with AFO. The most prominent enhancements were identified in knee extension moment at Mst. ( $p = 0.006$ ) and Tst. ( $p = 0.008$ ). The least changes were observed in hip joint that exhibited a significant increase in hip flexion moment ( $p < 0.001$ ) and power ( $p = 0.005$ ) at LR that may contribute to the AFO associated increased step length.

This study concludes that AFO had improved temporal-spatial gait parameters, sagittal plane ankle, knee and to lesser extent hip kinematic and kinetic parameters in CP patients. Further research is recommended to correlate those findings to individual patients' clinical conditions.

### 37. Improvements in insulin sensitivity outweigh a potential decline in beta-cell function in newly-diagnosed acromegalic patients treated with the somatostatin analogue lanreotide as a primary medical therapy

Sarah J Case, Andrew S Powlson, Mark Gurnell

**Background:** Acromegaly is a disorder of the growth hormone (GH) / insulin-like-growth- factor-1 (IGF-1) axis. It is associated with insulin resistance and, consequently, impaired glucose tolerance and diabetes mellitus. This may contribute to the excess cardiovascular mortality seen with this condition. Medical therapy with somatostatin analogues (SSAs) inhibits GH hypersecretion and may thus improve insulin resistance. However, SSAs may also directly reduce pancreatic insulin secretion, potentially offsetting any glycaemic benefits.

**Aims:** To assess the effect of the SSA lanreotide on pancreatic beta-cell function and insulin resistance in treatment-naïve acromegaly.

**Methods:** 39 newly-diagnosed, treatment-naïve patients with acromegaly were assessed before and after 24 weeks of lanreotide treatment in an open label cohort study. GH, IGF-1, fasting glucose, HbA<sub>1c</sub> and fasting insulin were measured, and HOMA-IR and HOMA- $\beta$  indices calculated.

**Results:** There was a significant reduction in GH (median 5.62 ng/mL [interquartile range 2.56,10.5]) and IGF-1 levels (expressed as IGF-1/upper limit of normal) (median 1.79 [1.08,2.67]). There was a corresponding significant decrease in fasting insulin (median 37.5pmol/L [0,66.25]) with no significant change in plasma glucose (+0.3mmol/L [-0.1,0.7]) and HbA<sub>1c</sub> (+0.1% [-0.2,0.25]). HOMA-IR (0.8 [0.3,1.4]) and HOMA- $\beta$  (34.3% [21,61.2]) both decreased significantly.

**Discussion:** Six months of SSA therapy successfully reduced GH/IGF-1 levels. The fall in fasting insulin with unchanged fasting glucose and HbA<sub>1c</sub> suggests a decrease in insulin resistance and the reduced HOMA-IR is in keeping with this. The lower HOMA- $\beta$  may either reflect the reduction in circulating insulin or an inhibitory effect of SSAs on insulin secretion. Importantly, however, as fasting plasma glucose and HbA<sub>1c</sub> did not increase, there appears to be an overall benefit of SSA treatment in acromegaly regardless of any direct effects on beta- cell function.

**Conclusion:** SSA therapy improves insulin sensitivity in acromegaly and, despite a potential inhibitory effect on insulin secretion, there are no adverse effects on glucose homeostasis.

### 38. A pilot study profiling urinary oxalate excretion and faecal *Oxalobacterformigenes* colonisation in patients pre- and post- gastric bypass

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Roux-en-Y gastric bypass (RYGB) is associated with risk of development of urolithiasis due to hyperoxaluria. *Oxalobacterformigenes* an obligate gut anaerobe, which metabolizes dietary and endogenously derived oxalate and colonisation with this bacterium may modulate the risk of hyperoxaluria. We conducted a pilot study in a small cohort of patients aimed at establishing a protocol for profiling urinary oxalate excretion and *Oxalobacterformigenes* colonisation pre and post-RYGB.

Four urine samples were collected over a two-day period by 18 patients (9 pre and 9 post- surgery) and analysed for urinary oxalate using enzymatic assay. In corresponding faecal samples, DNA was extracted and used in PCR based analysis of *Oxalobacterformigenes* colonisation. Overall mean, ( $\pm$  standard deviation) and median (interquartile range) minimum and maximum urinary oxalate levels were compared between pre and post- surgical samples. Statistical significance set at  $p < 0.05$

Mean pre-operative urinary oxalate concentration in pre-operative spot urines was  $0.339\text{mM} \pm 0.247$  versus  $0.369 (\pm 0.221)$  in post-operative urines ( $p=0.8$ ). Median minimal levels of urinary oxalate were  $0.123\text{mM} (0.164)$  pre-operatively versus  $0.082\text{mM} (0.184)$  post-operatively ( $p=0.574$ ). Median maximal levels of urinary oxalate pre-operatively were  $0.416\text{mM} (0.388)$  versus  $0.389(0.500)$  post-operatively ( $p=0.959$ ). 28% of samples from the study were positive for *Oxalobacterformigenes*. No association was noted between status (pre versus post-surgery) for urinary oxalate excretion level.

This study has developed a protocol for the assessing urinary oxalate excretion and *Oxalobacterformigenes* colonisation in patients with obesity before and after bariatric surgery. Normalisation of urinary oxalate levels by urinary creatinine and quantitative PCR will strengthen future analyses.

### 39. Food poverty and policy in Ireland: a review of the literature

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**Background:** Food poverty has emerged as a public health issue in the Republic of Ireland and Northern Ireland in the last decade. Data have consistently shown that those on lower incomes have a diet predominantly based around low-cost energy-dense foods high in fats and refined sugars, foods which increase the risk of obesity and cardiovascular disease. The aim of this literature review was to: quantify food poverty in Ireland, the effect it has on personal health and the implications for our health system, and to examine national policies aimed at alleviating it.

**Methods:** An extensive literature review provided the overall context for the project. This focused primarily on research conducted by government, public health institutes, international bodies, all-island bodies, non-governmental organisations (NGOs) and charities.

**Results:** There is a definite trend in nutritional discrepancies across the Irish population, with self-reported food deprivation higher in the lowest quintiles of income and social class. Accordingly, obesity in Ireland is a socio-economic phenomenon with food poverty as a major risk factor. Children are particularly affected by food poverty, with 21% of schoolchildren having reported going to school or bed hungry because of a lack of food at home. There have been major structural problems in how food inequality in the Irish population has been quantified; for example many marginalized groups such as Travellers and asylum seekers have not been included in national surveys. There is currently no coordinated policy in Ireland to guide initiatives which might address social inequality in dietary behaviour.

**Conclusion:** Given the deprivation rate nearly tripled between 2007 and 2013, the official figures for food poverty in Ireland must be reviewed. It is evident that the creation and acceptance of a standardised measure of food poverty is paramount in order to comprehensively understand the scale of the issue. An updated and coordinated all-island policy is urgently needed to prevent the impending tsunami of chronic disease caused by poor nutrition.