ROYAL COLLEGE of PHYSICIANS of EDINBURGH

Abstracts from the Research Symposium for Medical Students and Foundation Doctors

20 November 2019

November 2019

This abstract book has been produced using author-supplied copy and no editing has been undertaken.

No responsibility is assumed for any claims, instructions, methods or drug dosages included in the abstracts: it is recommended that these are verified independently.

Undergraduate Prizes

Best undergraduate oral presentation

Socioeconomic differences in cardiovascular disease risk factor prevalence in people with type 2 diabetes in Scotland: a cross-sectional study

Edward Whittaker (Supervisor: Prof. Sarah Wild)

University of Edinburgh

INTRODUCTION: Health inequalities exist in outcomes of diabetes in different socioeconomic groups and these are particularly marked for cardiovascular disease and its risk factors1. The aim of this study was to describe the association between socioeconomic status and prevalence of cardiovascular risk factors (smoking, body mass index, HbA1C, blood pressure and cholesterol) in people with type 2 diabetes in contemporary Scottish data.

PATIENTS AND METHODS: A cross-sectional study was performed of 264,011 people with type 2 diabetes in Scotland who were alive on 30/06/16, identified from the population-based diabetes register. Socioeconomic status was defined using quintiles of the area-based SIMD with Q1 and Q5 used to identify the most and least deprived fifths of the population respectively. Logistic regression models adjusted for age, sex, health board, history of cardiovascular disease and duration of diabetes were used to estimate odds ratios (OR) (and 95% confidence intervals) for Q1 compared to Q5 for each risk factor.

RESULTS: The mean (SD) age of the study population was 66.7 (12.8) years, 56.1% were men, 23.6% were in Q1 and 15.1% in Q5. Crude prevalence in Q1/Q5 was 24.4/8.8% for smoking, 61.9/49.4% for BMI ≥30kg/m2, 43.7/39.7% for HbA1C ≥58mmol/mol, 30.5/31.3% for systolic blood pressure (SBP) ≥140mmHg and 24.4/24.5% for total cholesterol ≥5mmol/l respectively. Adjusted prevalence of current smoking (OR 3.08 (95% CI 2.95-3.21)), ≥30kg/m2 (OR 1.48 (1.44-1.52)) and HbA1C ≥58mmol/mol (OR 1.11 (1.08-1.15)) were higher in Q1 compared to Q5. The prevalence of SBP ≥140mmHg was similar (OR 1.03 (1.00-1.06)), and the prevalence of total cholesterol ≥5mmol/l was lower in Q1 compared to Q5 (OR 0.87 (0.84-0.90)).

CONCLUSIONS: Socioeconomic deprivation is associated with higher prevalence of smoking, obesity, and HbA1C ≥58mmol/mol among people with type 2 diabetes in Scotland. Effective approaches to reducing inequalities at both population and individual levels are required as well as reducing risk factor prevalence across the whole population.

REFERENCES:

1. Read, S., Fischbacher, C., Colhoun, H., Gasevic, D., Kerssens, J., McAllister, D., Sattar, N., Wild, S. (2019). Trends in incidence and case fatality of acute myocardial infarction, angina and coronary revascularisation in people with and without type 2 diabetes in Scotland between 2006 and 2015. Diabetologia, 62(3), 418-425.

Best Undergraduate Poster

Establishing the effect of multi-ErbB inhibitors on TRIB2 mediated signalling in acute myeloid leukaemia

Rachel Porter (MBChB4), Dr Karen Keeshan

University of Glasgow

INTRODUCTION: TRIB2 is a pseudokinase which functions as a scaffold in cellular signalling and promotes proteasomal degradation. TRIB2 is an oncogene in Acute Myeloid Leukaemia (AML). AML is classified by genetic subtypes, many having no pharmacological targets putting paediatric mortality at 30-40%. The structure of the ATP binding site in TRIB2 provides a potential drug target. In the Ras-MAPK pathway, TRIB2 facilitates uncontrolled proliferation in AML through proposed interaction with MEK1 and ERK1/2. This pathway begins with ligand binding to multi-ErbB receptor tyrosine kinases (RTKs). Drugs which target these RTKs may be repurposed for AML therapy due to "on-target" binding to and destabilising TRIB2 which kills AML cells. Afatinib, Neratinib and Osimertinib are multi-ErbB inhibitors licenced for biological treatment. Erlotinib binds only to ErbB1 (EGFR) and has not been shown to destabilise TRIB2.

PATIENTS AND METHODS: Aims: This study aims to be the first stage in investigating if TRIB2 facilitates ErbB signalling in AML cells and has a role in response of leukaemia to multi-ErbB inhibitors. This research seeks to establish if multi-ErbB inhibitors induce AML cytotoxicity by performing dose response curves of Afatinib, Neratinib, Osimertinib and Erlotinib in TRIB2 positive human U937 AML cells in vitro using flow cytometry based apoptotic assay.

RESULTS: This study found micromolar cell toxicity for the multi-ErbB inhibitors, Afatinib, Neratinib, Osimertinib but not the single-ErbB1 inhibitor Erlotinib .The multi-ErbB inhibitors IC50 doses were determined to be below 20μM. Erlotinib did not show any AML cytotoxicity no statistical significance was seen between this drug and the control.

CONCLUSIONS: These findings support targeting ErbB1 alone is not enough to cause cell death in AML.
These results provide a baseline for research into the association between cell kill and expression of active kinases in the Ras-Raf-MEK-ERK pathway and its regulation by TRIB2. This may have potential pharmacological implications in paediatric AML treatment.

REFERENCES:
1. Eyers PA, Keeshan K, Kannan N. Tribbles in the 21st Century: The Evolving Roles of Tribbles Pseudokinases in Biology and Disease. Trends Cell Biol. 2017;27(4):284-98
2. Salomè M, Campos J, Keeshan K. TRIB2 and the ubiquitin proteasome system in cancer. Biochem Soc Trans. 2015;43(5):1089-94.
3. Foulkes DM et al. Covalent inhibitors of EGFR family protein kinases induce degradation of human Tribbles 2 (TRIB2) pseudokinase in cancer cells. Sci Signal. 2018;11(549).

Commended Undergraduate Poster

Junior Doctor's Perceptions and Experiences of the Emergency Department Departmental Handover

Miss Emily Park, Dr Susie Roy, Dr Janet Skinner

Edinburgh Medical School

INTRODUCTION: It is known there is a high prevalence of stress and burnout in both junior doctors and doctors working in Emergency Medicine. Although research has examined which aspects of

working life doctors find stressful, no literature was identified exploring if departmental handover itself is a source of stress for junior doctors. Therefore, the aim of this project is to investigate if junior doctors find the Emergency Department (ED) departmental handover stressful.

PATIENTS AND METHODS: Non-probabilistic sampling methods were used to recruit junior doctors (FY2-CT1) working in Royal Infirmary of Edinburgh's (RIE) Emergency Department (ED). Qualitative semi-structured interviews were undertaken between March and April 2019 until data saturation was reached. Perceptions and experiences of the ED departmental handover were explored. Interviews were audio-recorded and transcribed verbatim. Data were analysed thematically using NVivo software to identify emerging themes.

RESULTS: 10 participants were interviewed between the grades of FY2 and CT1. Interviews lasted between 16 and 61 minutes with an average duration of 30 minutes. Following thematic analysis of the data four themes were identified: stress decreases as familiarity increases, time pressure is an ongoing stressor, the handover as a solace and it's nice to be nice. Participants noted the fear of humiliation and appearing incompetent in front of seniors and colleagues as the main stressor when beginning work in the department. It was noted that with time; as relationships form and clinical experience improves that those stressors are ameliorated. Conversely, time pressure is an ongoing stressor due to the ED's focus on efficient handovers, busyness of the department and pressure from colleagues who are ending their shift to handover succinctly. It was found that the handover can also help to alleviate stress by facilitating the opportunity for peer socialisation, education and morale boosting. The final theme explores how the attitudes and behaviours of others in the department can affect the experiences of people working there. This encompasses support from seniors; attitudes, approaches and personalities of those running the handover; language and tone used in handovers, and team morale - with focus on fostering a civil and pleasant working environment.

CONCLUSIONS: Junior doctors find certain aspects of ED handover stressful. These include: wanting to make a good impression to seniors, workload (busyness of department), unfamiliarity and uncertainty, time pressures and the negative effects of hierarchy. However, it was also found that the ED departmental handover can help to ameliorate stress felt by junior doctors in the ED by facilitating the opportunity for socialisation, education and team morale boosting.

REFERENCES: BeyondBlue (2013). National mental health survey of doctors and medical students. Executive Summary; Braun V & Clarke V (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology.* 3, 77–101; Facey AD, Tallentire V, Selzer RM, Rotstein L (2015). Understanding and reducing work- related psychological distress in interns: a systematic review. Internal Medicine Journal. Royal Austrailasian College of Physicians. Machaczek K K (2014). Barriers to effective communication between doctors at shift handover. Sheffield Hallam University, UK; NHS Scotland (2016). Practicing Realistic Medicine. Chief Medical Officer's Annual Report 2016-17; Porath C & Pearson C (2013). The price of incivility. Harvard Business Review. 91, 114-21; Turner C (2018). Civility Saves Lives. Royal College of Obstetrics and Gynaecology.2018.

Commended Undergraduate Poster

A Reassessment of the Classification and Management of Eating Disorders: Should the Relative Importance of Symptoms and Aetiology Be Re-Balanced?

Sofia Weiss Goitiandia, David Bainbridge

Medical School, University of Cambridge

INTRODUCTION: Eating disorder (ED) pathology is an important cause of psychosocial and physical morbidity across multiple age groups, and is becoming increasingly prevalent1,2. This paper seeks to assess current knowledge about EDs, addressing the roles of potential causes (aetiology) as well as symptoms. How well this information is reflected by current diagnostic and management strategies is considered.

PATIENTS AND METHODS: The retrieval of data for this project was based on a comprehensive literature search, used to find papers that were appropriate for addressing the research question. In particular, the literature search method was used to access data pertaining to: (a) current knowledge
about ED aetiology, and symptoms; (b) ED classification and management strategies, as well as evaluations of these. The data retrieved were analysed by examining the scientific rigour of individual sources, and by collating the evidence from multiple sources on a given topic as a 'whole'. Key criteria sought at the level of primary source papers were relevance, as well as appropriate study design and controls, and conclusions that related well to the findings of the study. Once the data were collected and their credibility established, they were used to generate an up-to-date, evidence-based response to the research question.

RESULTS: The findings support that aetiological risk factors, including neurobiological, developmental and sociocultural processes, generate psychopathological features that are key to the establishment and maintenance of EDs. There is evidence that these factors are more important for diagnosis and treatment than current classification and management strategies suggest. On the basis of these results, this paper proposes a new model for ED classification, where the diagnosis is based not on specific presenting symptoms, but on the existence of characteristic psychopathological traits, many of which are conserved across ED presentations.

CONCLUSIONS: The principal implication of this model is that the focus of ED treatment should shift from symptom management to correcting the underlying psychopathology, and its causes. Long-term psychological intervention is likely to be key to achieving this goal, and the particular therapeutic strategies that could be used are considered.

REFERENCES:

1. Pike, K., Hoek, H.W. and Dunne, P.E. (2014). Recent cultural trends and eating disorders. *Current Opinion in Psychiatry.* 29: 346-53.
2. Smink, F.R.E, Van Hoeken, D. and Hoek, H.W. (2013). Epidemiology, course and outcome of eating disorders. *Current Opinion in Psychiatry.* 26: 340-5.

Undergraduate abstracts

Adrenomedullin (ADM) overexpression in U87 glioblastoma cells increases invasion and reduces sensitivity to temozolomide and ionising radiation in vitro

Hussein Al-Fazly, Julianna Stylianou, Atiya Sarmin, Combiz Khozoie, Alexander Renziehausen, Nelofer Syed

John Fulcher Neuro-Oncology Laboratory, Imperial College London

INTRODUCTION: Glioblastoma multiforme (GBM) is the most common primary brain tumour in adults (1). Despite current treatment, typically involving surgery followed by radiotherapy and temozolomide (TMZ), recurrence is almost inevitable, and median survival is only 15 months (2,3). Understanding the differences between primary and recurrent GBM might help guide the development of new targeted therapies. Recently, through RNA sequencing of 10 primary and recurrent GBM samples, we found
that ADM expression is upregulated in recurrent versus primary GBM, and its expression level was correlated with worse prognosis using TGCA data (4). Objectives: to explore the effect of ADM overexpression on GBM invasion and sensitivity to standard GBM therapy in vitro.

METHODS: U87 cells were transfected to overexpress ADM or an empty plasmid. ADM overexpression was confirmed with qPCR. Sensitivity to TMZ, ionising radiation, and the combination of the two, was determined with an SRB proliferation assay. Invasion was measured with a 3D spheroid invasion assay.

RESULTS: Compared to controls, U87 cells overexpressing ADM were significantly less sensitive to TMZ, radiation, and the combination of the two. 3D spheroids of cells overexpressing ADM had significantly larger areas of invasion.

CONCLUSION: ADM might play a significant role in GBM tumour recurrence and resistance to standard
therapy. Targeting ADM could be explored as a potential therapeutic strategy for GBM.

REFERENCES:

1) Ostrom QT, Gittleman H, Farah P, Ondracek A, Chen Y, Wolinsky Y, et al. CBTRUS statistical report: Primary brain and central nervous system tumors diagnosed in the United States in 2006 - 2010. J Neurooncol. 2013;15(6):788–96
2) Stupp R, Hegi ME, Mason WP, van den Bent MJ, Taphoorn MJ, Janzer RC, et al. Effects of radiotherapy with concomitant and adjuvant temozolomide versus radiotherapy alone on survival in glioblastoma in a randomised phase III study: 5-year analysis of the EORTCNCIC trial. Lancet Oncol. 2009;10(5):459–66.
3) Oh J, Sahgal A, Sanghera P et al. Glioblastoma: Patterns of recurrence and efficacy of salvage treatments. Can J Neurol Sci. 2011;38(4):621–5.
4) Khozoie C, Perryman R, Abaitua F, Vaqau B, O'Neill K, Syed N. PP11. RNA-Seq analysis of primary and recurrent glioblastoma identifies novel therapeutic strategies [abstract]. Neuro Oncol. 2017; 19(Suppl 1): i3–i4.

A visual analysis of gender bias in the most commonly used human anatomy textbooks at the University of Bristol

Natasha Alford

Supervisor: Dr Michelle Spear

University of Bristol

INTRODUCTION: This study aimed to examine the most popular textbooks at the University of Bristol for gender bias. This study defined gender bias as the exclusion of women from text and images in anatomy textbooks

PATIENTS AND METHODS: Through the library usage statistics, three textbooks were selected in the study: *Anatomy: a photographic atlas, Grays anatomy for students* and *Clinically Oriented Anatomy.* The study examined 684 images (386 male, 282 female and 16 neutral) from the three anatomy textbooks in which the sex of the image could be identified. The images were categorised as male, female or neutral.

RESULTS: The results showed that images which depicted male subjects outnumbered female or neutral images in all three textbooks. With 56.4 per cent of the images identified as male, 41 per cent of the images identified as female and 2 per cent as neutral. Of those 684, 400 were classified as sex-specific images and 284 as non-sex-specific. The results showed that the majority of female images were classified as sex-specific: 78.4 per cent were designated as sex-specific compared 21.6 per cent that were classified as non-sex-specific. In contrast 46.4 per cent of male images were classified as sex-specific. Sex-specific images are associated with reproduction. The study also found that male images were used more commonly to represent anatomy that was present in both sexes; for example, of the images displayed in the abdomen chapters, 75 per cent used male subjects, while only 12.5 per cent of the images showed female subjects

CONCLUSIONS: These findings reflect the historical precedent in anatomy education of using male images to depict anatomical structures present in both sexes and using female images to emphasise differences in reproductive anatomy. The study concludes that commonly used anatomy textbooks at the University of Bristol are gender biased, with the majority of the images depicting male subjects.

Uncontrolled hypertension; from determinants to management at emergency department of Baghdad teaching hospital

Mustafa Aljarshawi , Mina Alsaffar and Sara Alhalaq

University of Baghdad – College of Medicine

INTRODUCTION: Hypertension is uncontrolled when blood pressure reading is more than 140/90 mm Hg1. This condition places the individual at increased risk to develop Hypertensive crisis whether an emergency or urgency2. The aim of this study was to identify the proportion of uncontrolled hypertensive patients presenting to our emergency department, evaluate their management and review some characteristics of the condition among a group of Iraqi patients.

PATIENTS AND METHODS: Four hundred nine cases presented with blood pressure (>140/90 mm Hg) irrespective of past medical history of hypertension to emergency department at Baghdad teaching hospital, were included in this retrospective cross-sectional study. Data on sociodemographic status, chief complaints, past medical history, work-up, anti-hypertensive treatment and disposition was collected from patient records in the archives of emergency department between July and September 2017.

RESULTS: Cases with uncontrolled hypertension formed 6.56% of all admissions to emergency department. Means of systolic and diastolic blood pressure readings were 169.98 and 96.66 mm Hg, respectively. (45.47%) were male and (54.52%) were female. Average age was 54.95. 151 (2.4%) were cases of hypertension crisis among emergency department attendants. Diabetes mellitus was the single most common past medical condition among all cases. Shortness of breath was the main chief complaint (22%) in hypertension crisis cases, chest pain was the most common presenting complaint in all included cases. Management was not documented in records of 214 (50%), However, in most of the remaining cases 137 (70%) consisted of: loop diuretics (furosemide), Angiotensin converting enzyme inhibitors in 22 (11%), calcium channel blockers in 17 (8%), beta blockers in 13 (6%).

CONCLUSIONS: About One third of patients attended emergency department with elevated blood pressure were cases of hypertension crisis. Diabetes mellitus was the major co-morbidity. Local practice in management was not compliant to the guidelines and severity but subjected to the availability of resources in terms of treatment agents and formula.

REFERENCES:

1. Al-Lami, F. (2007) Proportion and Determinants of Uncontrolled Hypertension among Treated. Journal of the Faculty of Medicine, Vol.49, no.1, Pp.56-63[*online*].
2. Cooper, CM., Fenves, AZ.(2016) Hypertensive Urgencies and Emergencies in the Hospital Setting. Hospital Practice journal,Vol.44, no.1[*online*].

Evaluating and Communicating Hepatitis C Cascades of Care Data: A Journey Towards Elimination in Tayside, Scotland

Cassandra Baiano, Professor Jon Dillon, Dr Emma Robinson

ScotGEM (University of St Andrews/University of Dundee)

INTRODUCTION: Chronic Hepatitis C Virus (HCV) is one of the leading causes of liver cirrhosis and hepatocellular carcinoma, presenting a significant burden to systems across the world (1). The WHO has set Elimination Goals for 2030 tasking each health system with evaluating their own Cascade of Care (CoC), yet methods of displaying HCV data are debated (2,3). Establishing a global way to communicate CoC data would allow systems to evaluate epidemic progression, identify gaps in care, plan service delivery, monitor effectiveness, and exchange knowledge across settings. This project proposes a fresh way of codifying and displaying HCV data using Tayside, Scotland as a case study.

PATIENTS AND METHODS: Of Tayside's Hepatitis C Database of 3917 people, 1230 people that were alive, in Tayside and had at least one active HCV infection between January 2015 and July 2019 were analysed.

RESULTS: A coding framework, stacked clustered bar chart, and cumulative line graph were produced. The coding framework includes Cascade stages (Estimated Prevalence, Diagnosis, Treatment, Cure) and specific categories within those stages (ie. New Diagnosis, Previous Diagnosis, Diagnosis Can't Treat, etc.) The framework standardises definitions to facilitate comparison across settings. Like previous methods, the bar chart communicates trends and conversion rates. Uniquely, it provides nuanced stratification within each stage, such as the proportion of newly versus previously diagnosed patients accessing treatment each year, quantifying a system's ability to treat new versus lost-to-follow-up cases. The cumulative line graph maps progress towards targets.

CONCLUSIONS: This project proposes a novel way of displaying Cascades of Care data that relays yearly snapshots of an epidemic, cumulative progression over time, and relation to elimination targets providing a reporting method the WHO could use to track global infectious epidemics. This method could improve local service evaluation and healthcare planning, as well as knowledge exchange across global health systems.

REFERENCES:

1. Combating Hepatitis B and C to Reach Elimination by 2030 [Internet]. [cited 2019 Aug 6]. Available from:https://apps.who.int/iris/bitstream/handle/10665/206453/WHO_HIV_2016.04_eng.pdf; jsessionid=F2CEE42701151DF7FA053C5A3D08B210?sequence=1

2. Gardner EM, McLees MP, Steiner JF, del Rio C, Burman WJ. The Spectrum of Engagement in HIV Care and its Relevance to Test-and-Treat Strategies for Prevention of HIV Infection. Clin Infect Dis Off Publ Infect Dis Soc Am. 2011 Mar 15;52(6):793–800.

3. Safreed-Harmon K, Blach S, Aleman S, Boe Kielland K, Bollerup S, Cooke G, et al. The Consensus Hepatitis C Cascade of Care: standardized reporting to monitor progress toward elimination. Clin Infect Dis [Internet]. [cited 2019 Sep 26]; Available from: https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciz714/5540024

HEART FAILURE WITH PRESERVED EJECTION FRACTION - How it differs from heart failure with reduced ejection fraction in pathophysiology, aetiology and diagnosis

Reina Bannerji

Lancaster Medical School

INTRODUCTION: Heart failure is a condition that is widely recognised in medicine. Its diagnosis and treatments vary depending on its type. Heart failure with preserved ejection fraction (HFpEF) is a type of heart failure known to create confusion amongst healthcare professionals. It is distinguished from heart failure with reduced ejection fraction (HFrEF), using echocardiography and ejection fraction. This review aims to clarify the differences between the two types of heart failure, and explore the reasons behind difficulties in clinical judgement for HFpEF.

PATIENTS AND METHODS: In the form of a literature review, this essay explores the concept of HFpEF and how it differs from HFrEF. Databases for the articles were accessed via Lancaster University's 'One Search'. Databases searched were MEDLINE, PubMed and Google Scholar.

RESULTS: Generally, research on the topic agreed that HFpEF varies from HFrEF in pathophysiology, potentially aetiology and ejection fraction, although impaired ventricular contraction is a trait they both share. Both diastolic and systolic dysfunction can lead to HFpEF. In HFpEF, the heart cannot work optimally as a 'suction-pump' whereas in HFrEF the heart's function as a 'volume pressure pump' is impaired. The heart's ejection fraction differentiates diagnosis of HFrEF and HFpEF and is a key marker of prognosis in HFrEF. There is currently no such diagnostic marker for HFpEF. In an attempt to identify differences between HFpEF and HFrEF, it has emerged that a lack of research on HFpEF leaves many gaps in its definition and features, which may explain its perplexing nature in clinical practice. Considerable work has been done over the past 20 years in developing diagnostic criteria for HFpEF, but they are known to lack validity. Current therapeutic guidelines for HFpEF are also non-prognostic, in that they do not reduce mortality or morbidity. HFpEF is associated with a long list of co-morbidities and has been argued to be a result of their complications. Whether this list

is significantly longer than that for HFrEF and its relevance in prognosis of HFpEF, could be further topics of research and may clear confusion surrounding HFpEF.

CONCLUSIONS: It is very clear from the research that HFpEF and HFrEF are separate clinical phenomena. However, further study on HFpEF's aetiology may help provide a concrete definition for it, clear clinical confusion surrounding it and distinguish it from HFrEF with additional clarity. It may also help develop valid diagnostic criteria for it, which can be used to establish treatment of prognostic advantage for HFpEF.

REFERENCES:

1. Andrew P. Diastolic Heart Failure Demystified*. Chest. 2003;124(2):744-753.
2. Ferrari R *et al*. Heart failure with preserved ejection fraction: uncertainties and dilemmas. European Journal of Heart Failure. 2015;17(7):665-671.
3. Kovács S. Diastolic Function in Heart Failure. Clinical Medicine Insights: Cardiology. 2015;9s1: CMC.S18743.
4. McMurray J *et al*. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012. European Journal of Heart Failure. 2012;14(8):803-869.
5. Shammas R, Khan N, Nekkanti R, Movahed A. Diastolic heart failure and left ventricular diastolic dysfunction: What we know, and what we don't know. International Journal of Cardiology. 2007;115(3):284-292.
6. Zile M, Baicu C, Gaasch W. Diastolic Heart Failure — Abnormalities in Active Relaxation and Passive Stiffness of the Left Ventricle. New England Journal of Medicine. 2004;350(19):1953-1959.
7. Lam C. Heart Failure With Preserved Ejection Fraction. Journal of the American College of Cardiology. 2010;55(16):1711-1712.

Tumour microenvironment: the development of in vitro organoid model to study nasopharyngeal carcinoma-stromal fibroblast interaction

GA Barzyk, CW Dawson, LS Young

Warwick Medical School

INTRODUCTION: Approximately 95% of the world's population sustains a life-long, asymptomatic infection with Epstein Barr Virus (EBV), however the virus remains linked to the development of certain tumours in geographically distinct human populations. To date, the precise mechanism(s) involved in EBV-driven carcinogenesis are poorly understood. This project focuses on the interplay between tumour cells and fibroblasts, a component of the tumour microenvironment, and attempts to define the role of tumour cells in the formation of cancer-associated fibroblasts (CAFs) in nasopharyngeal carcinoma (NPC).

PATIENTS AND METHODS: 3 EBV-infected NPC cell lines were compared to an EBV-negative NPC counterpart. Complex organoids were created in 3D by culturing the epithelial cells with normal WI-38 fibroblast. Once grown, evidence of CAF formation was evaluated using antibodies specific for alpha-smooth muscle actin (α-SMA), epithelial cell adhesion molecule (EPCAM) and DAPI nuclear stain by analysing their expression and localisation. Western blot analysis for TGF-β and phosphorylated "active" SMAD2, one of the main signal transducers of TGF-β was used to assess the role of tumour-derived TGF-β secretion in CAF formation.

RESULTS: Phase contrast microscopy confirmed that all NPC tumour cell lines formed organoids in Matrigel while normal hTert-immortalised NP460 epithelial cells formed small numbers of differentiating cysts. In the presence of normal fibroblasts, NPC organoid formation appeared to be

enhanced. With immunofluorescence, number of CAFs were identified in the co-cultured NPC tumour cells but not in normal hTert-immortalised NP460 epithelial cells, suggesting fibroblast transformation. Western blot analysis for TGF-β1 and phosphorylated "active" SMAD2, showed that unlike normal nasopharyngeal cells, all three EBV-infected NPC tumour cell lines produced TGF-β1. However, unlike NP460 hTert, they failed to respond to TGF-β ligand as assessed by increased basal phosphorylation of SMAD2, indicative of a corruption of the TGF-β signalling pathway in NPC tumour cells.

CONCLUSIONS: To date, significant evidence shows that the TGF-β signalling pathway is tumour suppressive, thus contributing to the growth inhibition of normal cells and cancer cells which harbour an intact TGF-β pathway. Numerous findings reveal that corruption of this pathway is common in many types of cancer. NPC tumours show frequent dysregulation of the TGF-β pathway due to silencing or mutation of the TGF-β receptor genes. The lack of TGF-β signalling alongside increased production of TGF-β ligand suggests that NPC tumour cells not only become resistant to the growth inhibitory effects of TGF-β, but may modify cells within the tumour microenvironment to promote tumour growth. Analysis of the NPC-fibroblast interactions showed that co-culture of EBV-positive NPC tumour cells with normal fibroblasts resulted in CAF formation.

REFERENCES:

1. Xu, H., Lyu, X., Yi, M., Zhao, W., Song, Y. and Wu, K. (2018). Organoid technology and applications in cancer research. Journal of Hematology & Oncology, 11(1).
2. Zhou C, Li J, Lin L, Shu R, Dong B, Cao D, Li Q, Wang Z. A targeted transforming growth factor-beta (TGF-β) blocker, TTB, inhibits tumor growth and metastasis. Oncotarget. 2018 Feb 24;9(33):23102-23113.

Evaluating Patient Satisfaction with the Renal Dialysis Shared Decision Making Process

Lucy F. Baudains, Dr Mark Brady

Lancaster (Year 4)

INTRODUCTION: For patients with advanced Chronic Kidney Disease (CKD), opting for renal dialysis is a life altering decision both for themselves and their families. However, studies have revealed that shared decision making with regards to dialysis choices is an area that many patients feel needs improvement (1). The NHS stresses the importance of shared decision making as both patients and healthcare professionals typically overestimate the benefits of treatments and underestimate the harms (2). This project will specifically be looking at the renal services offered by Lancashire Teaching Hospitals Trust (LTHTR) where there is already a dedicated Renal Choices Team in place to assist patients and their families with these decisions.

PATIENTS AND METHODS: Via a postal questionnaire, we gathered information from a cohort of LTHTR dialysis patients and evaluated their satisfaction with the decision making process and whether they believe there are modifications that should be made. This information will then be made available to LTHTR so that they are able to consider any changes that could be implemented.

RESULTS: Key findings included positive comments about supportive staff and dialysis 'open days', however several areas were highlighted that could be improved upon such as patients lacking information about the option for conservative therapy as well as information regarding the lifestyle effects of dialysis. Additionally, many patients needing dialysis in an acute setting reported a lack of information despite NICE guidelines stating that patients who present late or begin dialysis in an

unplanned way should be offered the same information as patients who present at an earlier stage (3).

CONCLUSIONS: This project has found evidence of numerous strengths within the LTHTR renal service but has also highlighted areas where patients felt information was lacking. The results and suggested recommendations from this project will be shared amongst key professionals in the LTHTR renal team so that a comprehensive multidisciplinary team action plan can be drawn up to enhance the service CKD patients receive in relation to shared decision making.

REFERENCES:

1. Kidney Care UK. Results of the 2017 PREM Survey Released [Internet]. 2018 April [Cited 2019 April 10]. Available at: https://www.kidneycareuk.org/news-andcampaigns/ news/results-2017-prem-survey-released/
2. NHS England. Why is Shared Decision Making Important? [Internet]. 2019 [Cited 2019 April 10]. Available at: https://www.england.nhs.uk/shared-decision-making/why-isshared-decision-making-important/
3. National Institute for Health and Care Excellence. Renal Replacement Therapy and Conservative Management. Recommendations [Internet]. 2018 October [Cited 2019 April 10]. Available at: https://www.nice.org.uk/guidance/ng107

Consent in forefoot surgery; what does it mean to the patient?

L. Baxendale-Smith, J. McKinley, S. Middleton, C. Thomson

Edinburgh Medical School

INTRODUCTION: This study aimed to assess patient risk recall and define acceptable risk thresholds for patients undergoing elective forefoot procedures.

PATIENTS AND METHODS: Patients were interviewed in the pre-assessment clinic (PAC) or on day of surgery (DOS); some in both settings. A standardised questionnaire was used for all interviews, regardless of setting. Patients were tested on which risks they recalled from their consent process, asked for thresholds for five pre-chosen risks and asked about a sham risk.

RESULTS: Across all interviews, risk recall on DOS was significantly lower (p=0.049) than in PAC – this was repeated when comparing results from patients interviewed in both settings only. The mean reported risk thresholds greatly exceeded NHS Lothian's observed complication rates for forefoot procedures. The five risks tested for thresholds produced the same order in each interview setting, suggesting a patient-perceived severity ranking. Patients interviewed in both settings provided two sets of thresholds, allowing comparisons between them: on comparing these, DOS risk thresholds were seen to be greater for four of the five risks, however no differences were statistically significant. Patients answering the sham risk question incorrectly tended to recall fewer risks across all interviews.

CONCLUSIONS: This study shows that patient risk recall is poor, as previous literature outlines, reinforcing that consent process improvements could be made. It also illustrates the value of PAC visits in patient education, as shown by higher levels of recall when compared to DOS. A novel finding is that patients would proceed with operations despite large risks, presenting notable medicolegal impacts.

The genetic landscape of Hepatitis Delta Virus infection

Carola Maria Bigogno, Roya Razavi Falahieh, Kai Man Alexander Ho, Anna Jeffrey-Smith, Meleri Jones, Carla Usai, Arianna Battisti, Upkar Gill and Patrick Kennedy

Queen Mary University of London – Barts and The London School of Medicine and Dentistry

INTRODUCTION: Hepatitis D virus (HDV) is a small, defective RNA virus, which requires hepatitis B virus (HBV) for entry into the hepatocytes, but its genome replication is independent of HBV. Over 15 million people are affected by HDV worldwide, always occurring in the presence of HBV. HBV/HDV co-infection is associated with an acceleration of liver disease, leading to cirrhosis, liver cancer and eventually liver failure. The virus is highly variable, and 8 genotypes have currently been identified. This variability has a great impact on identifying standardised diagnostic tools as well as specific direct anti- HDV drugs. Currently, the standard treatment for HDV consists of a 48-week course of Pegylated Interferon α (Peg-IFN-α), but it is highly ineffective with a sustained virological response rates of 25%. Novel agents, such as Myrcludex B, have shown promise, but remain in the development pipeline. The aim of the study is to sequence and genotype HDV samples of patients managed at the Royal London Liver Unit. Moreover, mutational analysis was conducted to confirm the high variability of HDV.

PATIENTS AND METHODS: 16 HDV patient were identified from the Liver Unit at Barts Health NHS Trust. 62.5% were males, with a median age of 37 years old. 62.5% patient were originally from Europe, 25% from Africa and 12.5% from Asia. Plasma samples were collected and viral RNA was inactivated and extracted. Reverse transcription was performed to obtain viral cDNA. A specific sequence of the virus was amplified, which was then sequenced using Sanger technique. Mutational analysis and sequence alignment allowed for the generation of a phylogenetic tree using MEGA©.

RESULTS: Mutational analysis showed the presence of *quasispecies*, which define the high variability of nucleotides within the viral pool in each patient. This is due to high replication rate of the virus and the lack of an error-checking mechanism. Sequence alignment also confirmed the high variability of HDV. Finally, phylogenetic analysis using MEGA© allowed the genotyping and subtyping of the 16 samples. 15 samples were found to be genotype 1. This was coherent with our expectations, considering that genotype 1 is the most prevalent. 1 sample was found to be genotype 5 – this was also coherent, as genotype 5 is predominantly found in sub-Saharan Africa, which is were this specific patient is originally from.

CONCLUSIONS: We can conclude that the project aims were met, and the study provides valuable information which will add to the current limited understanding of HDV. Future work will focus on full-length sequencing and next-generation analysis of HDV from the same cohort of patients. This will aid in the identification of the HDV *quasispecies*, which will be used to provide a better understanding of the biological events in HDV infection, as well as to improve diagnostic assays and treatment decisions.

REFERENCES:

(1) Taylor JM. Hepatitis D Virus Replication. Cold Spring Harb Perspect Med. 2015;5(11):a021568.
(2) Hughes SA, Wedemeyer H, Harrison PM. Hepatitis delta virus. Lancet. 378(9785):73-85.
(3):e0175304. (4) Farci P. Delta hepatitis: an update. Journal of Hepatology. 2003;39:212-9.
(4) Farci P, Mandas A, Coiana A, Lai ME, Desmet V, Van Eyken P, et al. Treatment of chronic hepatitis D with interferon alfa-2a. N Engl J Med. 1994;330(2):88-94.

The role of microglia and Integrin beta-3 in a mouse model of fast and slow amyotrophic lateral sclerosis.

Bethan Bishop, Caterina Bendotti, Andrea Malaspina, Ping K. Yip

Barts and the London School of Medicine and Dentistry

INTRODUCTION: Amyotrophic lateral sclerosis (ALS) is a neurodegenerative condition that causes upper and lower motor neuron loss leading to disability and early death. Fast and slow progressing phenotypes have been identified but the reason for this variation in progression rate is unknown. Increased expression of microglial markers in the spinal cord in ALS suggests that microglia may contribute to its pathophysiology (Graber et al., 2010). In addition, Integrin β3 was raised in the plasma of ALS patients and SOD1G93A mice with fast progressing disease compared to their slow progressing counterparts (Zubiri et al.,2018). Therefore, this study aimed to investigate the influence of microglia and Integrin β3 on ALS progression rate at the lumbar spinal cord level of SOD1G93A mice.

PATIENTS AND METHODS: Lumbar spinal cord sections from presymptomatic mouse models of fast ALS (129Sv-SOD1G93A), slow ALS (C57-SOD1G93A), and their corresponding non-transgenic littermates (129Sv-WT, C57-WT) were immunohistochemically stained for the microglia-specific marker P2Y12 and Integrin β3 (n = 3-6).

RESULTS: There was no significant difference in P2Y12 expression in the lateral funiculus, ventral funiculus, dorsal horn, or intermediate grey matter in fast or slow ALS compared to their respective controls. In the dorsal funiculus and ventral horn, P2Y12 expression was significantly increased in fast ALS compared to the fast control ($p = 0.031$ and $p = 0.006$, respectively) but there was no significant difference between slow ALS and the slow control. There was no significant difference in Integrin β3 expression in the dorsal funiculus, lateral funiculus, dorsal horn, intermediate grey matter, or ventral horn in fast or slow ALS compared to their respective controls. In the ventral funiculus, Integrin β3 expression was significantly increased in fast ALS compared to the fast control ($p = 0.020$) but there was no difference between slow ALS and the slow control. On qualitative analysis, Integrin β3 expression appeared to be predominantly neuronal.

CONCLUSIONS:

- Microglia may be involved in motor neuron loss in fast ALS, suggesting antimicroglial therapies may be of interest in the condition.
- Integrin β3 is predominantly expressed by neurons, suggesting the αVβ3 integrin receptor may contribute to specific motor neuron vulnerability in ALS.
- Increased Integrin β3 in the ventral funiculus in fast ALS but not slow ALS suggests increased αVβ3 integrin receptor expression may expedite ALS progression and Integrin β3 could be a potential biomarker for fast ALS.

REFERENCES: Graber et al., (2010). *Journal of Neuroinflammation, 7(1).* Morisaki et al., (2016). *Scientific Reports*, 6(1). Zubiri et al., (2018). *Molecular Neurodegeneration*, 13(1).

Vitamin D status in chronic tic-disorder and comorbid obsessive-compulsive disorder and attention-deficit/hyperactivity disorder: A pan-European study

Molly Bond*, Natalie Moll*, Alicia Rosello, Rod Bond, Jaana Schnell, Bianka Burger, Pieter J. Hoekstra, Andrea Dietrich, Anette Schrag, Eva Kocovska, Davide Martino MD, Norbert Mueller, Markus Schwar, Ute-Christiane Meier and the EMTICS collaborative group

*joint first authors

Barts and The London School of Medicine and Dentistry, Queen Mary University

INTRODUCTION: Hypovitaminosis-D has been linked to a number of neuropsychiatric conditions (1) (2) (3), but little is known about vitamin D status in children and adolescents with chronic tic disorders (CTD) (4). This study sought to determine whether vitamin D levels are associated with the severity of tics and presence and severity of comorbid obsessive-compulsive disorder (OCD) and/ or attention deficit/ hyperactivity disorder (ADHD).

PATIENTS AND METHODS: This is a cross-sectional sub-study of the European Multicentre Tics in Children Studies (EMTICS) (5). Vitamin D [25(OH)D] levels (ng/ml) were obtained at study entry for 327 participants with CTD at 16 centres in 9 countries across Europe and in Israel. Tic severity was measured using the Yale Global Tic Severity Scale (YGTSS) (6). An association between tic severity and presence and severity of comorbid OCD and/or ADHD symptoms was analysed using multilevel models controlling for season, site, sex, age and presence of comorbid OCD and/or ADHD.

RESULTS: The participants comprised 247 boys and 80 girls (4-16 years, mean [SD], 10.9 [2.72]). Hypovitaminosis-D ([25(OH)D] < 20ng/ml) was present in 33% of participants with CTD and/ or comorbid OCD and/ or ADHD. The authors found no association between 25(OH)D levels and tic severity or OCD symptom severity. However, lower 25(OH)D levels were significantly associated with increased severity of ADHD symptoms in participants with CTD (β = -0.25, s.e. = 0.08, 95% CI, -0.42 to -0.09; $p < 0.01$).

CONCLUSIONS: This is the first study to investigate a relationship between 25(OH)D levels and severity of tics along with comorbid OCD and/or ADHD in young individuals with CTD. Additional research is needed to confirm these findings and assess whether hypovitaminosis-D may represent an underlying biological vulnerability for comorbid ADHD symptoms in CTD as it may signpost novel strategies for prevention and treatment.

REFERENCES:

1. Eyles DW, Burne TH, McGrath JJ. Vitamin D, effects on brain development, adult brain function and the links between low levels of vitamin D and neuropsychiatric disease. Front Neuroendocrinol. 2013;34(1):47-64.
2. Kočovská E, Gaughran F, Krivoy A, Meier UC. Vitamin-D Deficiency As a Potential Environmental Risk Factor in Multiple Sclerosis, Schizophrenia, and Autism. Front Psychiatry. 2017;8:47.
3. Wacker M, Holick MF. Sunlight and Vitamin D: A global perspective for health. Dermatoendocrinol. 2013;5(1):51-108.
4. Li HH, Shan L, Wang B, Du L, Xu ZD, Jia FY. Serum 25-hyroxyvitamin D levels and tic severity in Chinese children with tic disorders. Psychiatry Res. 2018;267:80-4.

5. Schrag A, Martino D, Apter A, Ball J, Bartolini E, Benaroya-Milshtein N, et al. European Multicentre Tics in Children Studies (EMTICS): protocol for two cohort studies to assess risk factors for tic onset and exacerbation in children and adolescents. Eur Child Adolesc Psychiatry. 2018.
6. Leckman JF, Riddle MA, Hardin MT, Ort SI, Swartz KL, Stevenson J, et al. The Yale Global Tic Severity Scale: initial testing of a clinician-rated scale of tic severity. J Am Acad Child Adolesc Psychiatry. 1989;28(4):566-73.

Actin-Based Mechanisms of Chromosome Segregation

Elanor Brooks, Binyam Mogessie

University of Bristol

INTRODUCTION: Chromosome segregation is conserved throughout eukaryotes: all eukaryotic cells divide by assembling a spindle machinery from microtubules that equally segregates chromosomes between daughter cells. Erroneous chromosome segregation produces aneuploid eggs, the fertilisation of which can result in genetic disorders (such as Down's syndrome) as well as embryo deaths and spontaneous abortions. The movement of chromosomes is driven by the shortening of microtubule bundles called kinetochore fibres (k-fibres) (1). It has recently been established that bundles of spindle-associated actin (spindle actin) organise microtubules into functional k-fibres that can efficiently align and segregate chromosomes (2). However, the molecular mechanisms that orchestrate meiosis-specific actin-microtubule crosstalk remain unknown.

PATIENTS AND METHODS: Data from prior experiments were analysed to quantify lagging chromosomes and chromosome misalignment in live mouse oocytes with disrupted spindle actin. Myosin-10, Clip-170 and Septin-2 were chosen from the literature as candidate spindle actin assembly proteins (SAAPs), due to their ability to associate with both actin and microtubules (3, 4, 5). Their requirement for spindle actin assembly was examined by loss-of-function assays. This was implemented using a novel method for acute and rapid degradation of endogenous proteins called TRIM-Away, which required the identification of antibodies against SAAP candidates that work in immunofluorescence assays (6). Super-resolution live microscopy of fluorescently labelled actin, microtubules and chromosomes was used in living and fixed cells to examine the requirement of candidate SAAPs for meiosis (3).

RESULTS: Eggs with disrupted spindle actin were more likely to suffer from chromosome segregation errors, which supports previously published data. Depletion of Septin-2 was unsuccessful, but several promising antibodies were identified against Myosin-10 and Clip-170. These candidate SAAPs were successfully depleted in preliminary experiments, although the resulting effect on spindle actin and chromosome segregation was unclear.

CONCLUSIONS: Spindle actin is required for faithful chromosome alignment and segregation. The interaction between actin and microtubules is fundamental to this process and may be enabled by linker proteins such as Myosin-10 and Clip-170. Further study is necessary to precisely determine their role in the molecular framework that assembles spindle actin for accurate chromosome segregation in mammalian oocytes.

REFERENCES:

1. J. C. Schmidt et al., The kinetochore-bound Ska1 complex tracks depolymerizing microtubules and binds to curved protofilaments. Dev Cell 23, 968-980 (2012).
2. B. Mogessie, M. Schuh, Actin protects mammalian eggs against chromosome segregation errors. Science 357 (2017).

3. K. L. Weber, et al., A microtubule-binding myosin required for nuclear anchoring and spindle assembly. Nature 431, 325-329 (2004).
4. J. L. Henty-Ridilla et al., Accelerated actin filament polymerization from microtubule plus ends. Science 352, 1004-1009 (2016).
5. B. E. Kremer et al., Mammalian Septins Regulate Microtubule Stability through Interaction with the Microtubule-binding Protein MAP4. Molecular Biology of the Cell 16, 4648-4659 (2005).
6. D. Clift et al., A Method for the Acute and Rapid Degradation of Endogenous Proteins. Cell 171, 1692-1706 e1618 (2017).

Healing Our Planet: What lessons can we learn from measuring the carbon footprints of healthcare facilities and interventions?

Catherine Rose Burns

Barts and the London School of Medicine, Queen Mary University of London

INTRODUCTION: Anthropogenic climate change represents an unparalleled threat to human health which may compromise the well-being of healthy individuals and exacerbate pre-existing health conditions. Healthcare professionals are becoming aware of the need to reduce the carbon footprint (CF) of healthcare, for financial and public health purposes. Yet it remains difficult for the practising clinician to be sustainable, due to a lack of clinical CF data.

PATIENTS AND METHODS: A search of the current literature in PubMed was carried out to find studies that examined how the CF of healthcare interventions/facilities can be altered using different devices, interventions or through sustainable changes. Fifteen primary studies were selected for inclusion and thematic analysis.

RESULTS: Four descriptive themes were developed during thematic analysis: method of CF measurement, reusable versus disposable items, treatment modality effects and the role of transport. Seven studies used standardised guidelines produced by the UK's Department for Environmental, Food and Rural Affairs. Six studies used a variety of guidelines and the remaining two did not reference their calculations. Only eight of the studies used (units)CO2 *equivalent* as units. Two studies found that reusable devices created CF reductions. McPherson et al 2019 noted the adoption of reusable items significantly reduced the CF by 65% per annum. Yet, Davis et al 2018 found no significant difference between the use of disposable and reusable devices; McGain et al 2012 reported reusable devices increased the CF, mostly due to sterilisation processes and the need for more raw materials for sterilisation. Treatment modality can significantly affect CF. One study stratified anaesthetic gases by their CFs, whilst another compared different surgical approaches; both demonstrated the potential for CF reduction in the operating theatre. Advancements in robotically-assisted surgery appear to further increase the CF by 38-77%. Furthermore, there is evidence that a curative surgical treatment is eventually better than a long-term medical treatment in terms of carbon efficiency, despite the long lag time to carbon efficiency. Two studies considered the merits of multi-disciplinary approaches, in a mental health therapeutic community and a social prescribing group, but these studies failed to establish a significant reduction in the CF relative to their control groups. Telemedicine significant reduced the CF, particularly through shortening the huge distances accrued by rural patients; one telemedicine study reported a reduction in greenhouse gases of 94-99%. The decentralisation of healthcare could further reduce CFs by limiting patient travel, for example Bond et al 2009 found that mobile breast screening units shortened journey distance for 96% of patients and lowered the CF by 1.25kgCO2/patient.

CONCLUSIONS: The development of a unified CF calculator in units of (CO2*equivalent*) could enable an evidence base for CFs to be established in each medical and surgical specialty; resources available to clinicians should provide information on CF. New technologies, particularly surgical robotics, should be designed with sustainability in mind. Reductions in healthcare-related transport may produce the greatest carbon savings, particularly telemedicine. Establishing climate change as a public health priority is imperative. The policies created today require a unified multi-disciplinary and multi-sectorial approach to succeed and safeguard the health of the generations to come.

REFERENCES: McPherson et al. The impact on life cycle carbon footprint of converting from disposable to reusable sharps containers in a large US hospital geographically distant from manufacturing and processing facilities. PeerJ. 22;7:e6204. 2019. / **Davis NF et al**. Carbon Footprint in Flexible Ureteroscopy: A Comparative Study on the Environmental Impact of Reusable and Single-Use Ureteroscopes. J Endourol [Internet]. 32(3):214–7. 2018. / **Chen M et al**. The carbon footprints of home and incenter peritoneal dialysis in China. Int Urol Nephrol. Feb 15;49(2):337–43. 2017. / **MacNeill A**. The impact of surgery on global climate: a carbon footprinting study of operating theatres in three health systems. Lancet Planet Heal. 1(9):e381–8. 2017. / **Coombs NJ et al**. Environmental and social benefits of the targeted intraoperative radiotherapy for breast cancer: data from UK TARGIT-A trial centres and two UK NHS hospitals offering TARGIT IORT. BMJ Open. 9;6(5):e010703. 2016. / **Maughan D et al**. Evaluating sustainability: a retrospective cohort analysis of the Oxfordshire therapeutic community. BMC Psychiatry. 11;16(1):285. 2016. / **Maughan DL et al**. Primary-care-based social prescribing for mental health: an analysis of financial and environmental sustainability. Prim Health Care Res Dev. 29;17(2):114–21. 2016. / **Woods DL et al**. Carbon footprint of robotically-assisted laparoscopy, laparoscopy and laparotomy: a comparison. Int J Med Robot Comput Assist Surg. 11(4):406–12. 2015. / **Holmner Å et al**. Carbon Footprint of Telemedicine Solutions - Unexplored Opportunity for Reducing Carbon Emissions in the Health Sector. Linkov I, editor. PLoS One. 4;9(9):e105040. 2014. / **Oliveira et al**. Teleconsultations reduce greenhouse gas emissions. J Health Serv Res Policy. 14;18(4):209–14. 2013. / **Sherman J el al**. Life Cycle Greenhouse Gas Emissions of Anesthetic Drugs. Anesth Analg. 114(5):1086–90. 2012. / **McGain et al**. A life cycle assessment of reusable and single-use central venous catheter insertion kits. Anaesthetics & Analgesia. 114(5):1073-1080. 2012. / **Gatenby et al**. Modelling the carbon footprint of reflux control. Int J Surg [Internet]. 9(1):72–4. 2011. / **Connor A et al**. The carbon footprints of home and in-center maintenance hemodialysis in the United Kingdom. Hemodial Int. 15(1):39–51. 2011. / **Bond A et al.** Tackling Climate Change Close to Home: Mobile Breast Screening as a Model. J Health Serv Res Policy. 11;14(3):165–7. 2009. / **Watts N et al**. Health and climate change: policy responses to protect public health. Lancet [Internet]. 2015 Nov 7;386(10006):1861–914.

Accidental traitors of cancer immunity: T-cells that alter cancer-associated fibroblasts

Vishwani Chauhan, Richard O'Connor, Ahsan Akram

University of Edinburgh

INTRODUCTION: Increasingly personalised approaches are under development for the treatment of non-small cell lung (NSCL) cancer, such as using a tumour's programed death-1 (PD-1) ligand signature to identify patients who may respond to immune checkpoint inhibitors. Despite promising results, checkpoint blockade has benefited only a minority of patients. Improved therapeutic stratification and better understanding of biological mechanisms underlying treatment resistance/failure are required to enhance outcomes for those who can significantly benefit from checkpoint blockade. In recent times, the tumour microenvironment (TME) has gained increased interest for its immunosuppressive properties. We investigated the expression of PD-1 ligands in the TME's principle cell type, cancer-associated fibroblasts (CAFs). The aim of our work was to assess the

effects of cytokines, such as IFNγ and TNFα, released by anti-tumour T-cells that are primed in a Th1-dominant cytokine milieu, on the CAF expression of PDP1 ligands, PD-L1 and PD-L2, and major histocompatibility complex Class I (MHC I) and Class II (MHC II). This looked to elucidate one side of the potential immunosuppressive crosstalk existing between CAFs and T-cells that could lead to a better understanding of the TME's immunomodulatory potential.

PATIENTS, METHODS, AND RESULTS: Previously, interferon-γ (IFNγ), a crucial antitumour cytokine released by effector T-cells, has been shown to paradoxically upregulate PD-L1 on tumour cells. Using CAFs from up to n=8 different primary human NSCL tumours, we studied the impact of T-cell-secreted factors on PD-1 ligand expression on CAFs. T-cells expanded in ILP2 from up to n=3 NSCL tumour-infiltrating lymphocytes were shown by intracellular flow staining to produce IFNγ when activated. ELISA-quantification revealed high IFNγ secretion by these tumour-derived T-cells, but none by CAFs from primary NSCL tumours. CAFs were treated with either recombinant IFNγ or culture-supernatant from activated tumour-derived T-cells. After 48 hours, treated CAFs showed significantly upregulated levels of PD-L1 ($p<0.05$), PD-L2 ($p<0.05$), MHC I ($p<0.05$), and MHC II ($p=0.052$), compared to untreated CAFs. The upregulatory effect of T-cell culture-supernatant was blocked by neutralising IFNγ. Tumour-derived T-cells were also found to produce tumour necrosis factor (TNFα) when activated. We considered whether multiple cytokines within T-cell culture-supernatant underlay PD-1 ligand upregulation on CAFs, indeed revealing that IFNγ and TNFα synergistically increased the percentage of CAFs highly expressing PD-L1 ($p\leq0.01$), PD-L2 ($p\leq0.01$), and MHC I ($p\leq0.01$) [Figure-1], while MHC II expression remained primarily IFNγ-dependent.

CONCLUSIONS: Our results suggest that T-cell-derived factors induce an immunosuppressive phenotype in CAFs, since cytokines from tumour-derived T-cells induced high levels of PD-L1 and PD-L2. In particular, we have shown cytokine-mediated MHC I and MHC II upregulation in CAFs, highlighting interesting possibilities of CAFs as antigen-presenting cells that are immunosuppressive alongside checkpoint molecule expression. The findings have physiological relevance, as the effects were replicated by T-cell culture supernatant and blocked by neutralising IFNγ in the supernatant.

Future work with CAF/T-cell co-cultures will reveal whether this CAF phenotype has functional immunosuppressive significance. These findings underscore how a greater understanding of the TME's immunomodulatory potential may eventually allow improved treatment stratification and clarify mechanisms underlying response or resistance to therapy.

Tissue Sodium Accumulation in Hypertension

Jun Yu Chen, Dr Giacomo Rossitto, Professor Christian Delles

Institute of Cardiovascular and Medical Sciences, University of Glasgow

INTRODUCTION: Hypertension has a global prevalence of 40%, impacting on mortality and morbidity. Traditionally, the kidneys regulate excess sodium (Na+), expanding the body's xtracellular volume, leading to an increase in blood pressure. However, animal and human studies have shown that osmotically inactive Na+ accumulates in skin, correlating with hypertension. Although mechanisms have been suggested, we are uncertain as to whether the Na+ accrual is water-independent (hypertonic) or water-paralleled (isotonic).

PATIENTS AND METHODS: A group of female SHRSP and WKY rats aged 12 weeks were given a fixed amount of 1% sodium chloride water each day for 3 weeks. Untreated rats (controls) were age-matched at 15 weeks (n = 8-12 per group). Skin, lung and liver samples were used to determine Na+

and K+ content and concentration, and water content. In a parallel clinical study, hypertensive human subjects were recruited, and measures of skin water exchange were taken such as skin biopsy, sweat collection and transepidermal water loss.

RESULTS: In the skin, there was a trend for increasing Na+ concentration and corresponding water content between the control SHRSP and salt-loaded SHRSP ($p = 0.024$ and $p = 0.023$, respectively). In the lungs, differences across groups were observed. Salt-loaded SHRSP had significantly more Na+ concentration than salt-loaded WKY (ANOVA, p = 0 003). Corresponding increase in water content was seen (ANOVA, $p = 0.009$). In the liver, differences in Na+ and parallel changes in water was seen in the controlled animals ($p = 0.025$ and 0.005, respectively) In all tissues, similar total ion concentration was observed across groups. In the clinical study, 90 patients were recruited. Water content showed a positive correlation with Na+ content in epidermal ($r = 0.81$, $p < 0.001$) and dermal ($r = 0.94$, $p < 0.001$) skin samples. Na+ and K+ constitute most ions in the body. Their combined concentrations were consistently around physiological levels in both skin samples.

CONCLUSIONS: Our findings suggest that salt-loading significantly increases the sodium content of lungs in hypertensive rodent models. There was a trend for an increase in Na+ in the skin of hypertensive rodent models. We were unable to demonstrate the same findings in liver. Increased Na+ accumulation in the lungs seemed to show an identical distribution to increased water content of the tissue, suggesting that this accumulation is not hypertonic, but rather isotonic, causing oedema. The clinical study confirms the animal findings whereby Na+ accumulation is water paralleled. Different Na+ content may reflect different tissue structures and subclinical oedema in specific subgroups e.g. ageing.

REFERENCES:

1. Titze J et al. Reduced osmotically inactive Na storage capacity and hypertension in the Dahl model. Am J Physiol Physiol [Internet]. 2002 Jul [cited 2019 Apr 3];283(1):F134–41. Available from: http://www.physiology.org/doi/10.1152/ajprenal.00323.2001
2. Kopp C et al. 23Na Magnetic Resonance Imaging-Determined Tissue Sodium in Healthy Subjects and Hypertensive Patients. Hypertension [Internet]. 2013 Mar [cited 2019 Apr 3];61(3):635–40. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23339169

Random synchronous lymphoma and metastatic papillary thyroid carcinoma in a 76 year old presenting with a neck swelling

Dr H. Jones, Weiyu Chen, Mr J. England

Hull York Medical school

INTRODUCTION: Multiple synchronous primary cancers are an uncommon presentation in head and neck oncology(1). When they do occur, synchronous primaries usually arise in the context of “field change”, with common aetiological factors implicated(2). Synchronous primaries with differing histologic origin are rare. Synchronous primaries presenting as bilateral lymphadenopathy of differing histology are rarer still. The authors present a patient with metastatic papillary thyroid carcinoma and synchronous lymphoma, causing bilateral lymphadenopathy of differing histology with asymmetrical imaging appearance.

PATIENTS AND METHODS: We report a case of dual neck pathology of papillary thyroid carcinoma and follicular lymphoma in a 76 year old female. The patient was referred with a 4-week history of a left level 2 neck swelling. The ultrasound suggested papillary thyroid cancer with bilateral

lymphadenopathy. PET scan showed asymmetrical metabolic profile at the neck. A subsequent core biopsy confirmed the diagnosis of follicular lymphoma.

CONCLUSIONS: This is the first reported case of bilateral cervical lymphadenopathy with differing pathology at right and left neck. In cases of bilateral lymphadenopathy with asymmetric metabolic profile, synchronous primary cancer should be suspected.

REFERENCES:
1. Rennemo E, Zatterstrom U, Boysen M. Synchronous second primary tumors in 2,016 head and neck cancer patients: role of symptom-directed panendoscopy. Laryngoscope. 2011;121(2):304-9.
2. Slaughter DP, Southwick HW, Smejkal W. Field cancerization in oral stratified squamous epithelium; clinical implications of multicentric origin. Cancer. 1953;6(5):963-8.

Classification of patients with myocardial injury and infarction according to the Fourth Universal Definition

Justin Chiong, John Hung, Anda Bularga, Stacey Stewart, Lucy Marshall, Marwa Daghem, Takeshi Fujikawa, Fiona E Strachan, Marc Dweck, David E Newby, Nicholas L Mills, Andrew R Chapman

The University of Edinburgh

INTRODUCTION: The Fourth Universal Definition recognises that myocardial infarction (MI) may occur due to myocardial oxygen supply demand mismatch, rather than coronary artery plaque rupture1. This condition is known as a type 2 myocardial infarction; it is common but poorly understood, and associated with poor prognosis, with as few as three in ten patients alive at five years[2].

PATIENTS AND METHODS: The DEMAND-MI study is a prospective observational cohort study evaluating the role of coronary artery disease in patients with type 2 myocardial infarction, using invasive and non-invasive imaging. Unselected patients (n=2,268) presenting with elevated troponin concentrations between 22nd of January 2018 and 29th of October 2018 were classified according to the Fourth Universal Definition of MI (UDMI). We compared demographics, cardiovascular risk factors, clinical presentation, features of myocardial ischaemia and treatment across groups.

RESULTS: Of all patients screened, 642 (28%) had a type 1 MI due to atherosclerotic plaque rupture, 235 (11%) a type 2 MI due to oxygen supply or demand imbalance and 1,391 (61%) had non-ischaemic myocardial injury. Of 28 patients with type 2 MI who were recruited to the trial, the average age was 65.4 years (64% male) and the majority had $\geq$1 cardiovascular risk factor (82%). Just over half of patients presented with ischemic chest pain and 68% had myocardial ischaemia on electrocardiogram. At presentation, the median high-sensitivity cardiac troponin I concentration was 235 ng/L with a peak of 1197 ng/L. Tachycardia was the most common aetiology for supply demand imbalance (29%). Approximately 20% of patients with type 2 MI received anti-platelet therapy.

CONCLUSIONS: In a consecutive population of hospitalised patients with elevated cardiac troponin concentrations, the majority had non-ischaemic myocardial injury, with one in ten having a diagnosis of type 2 myocardial infarction. These patients had a wide variety of presenting complaints, and cardiovascular risk factors were common. Whether identifying cardiovascular risk factors can lead to targeted treatments and improved outcomes is uncertain.

REFERENCES:
1. Thygesen K, Alpert JS, Jaffe AS, Chaitman BR, Bax JJ, Morrow DA et.al. Fourth Universal Definition of Myocardial Infarction (2018). European Heart Journal 2018; 40(3): 237-269.
2. Chapman AR, Shah ASV, Lee KK, Anand A, Francis O, Adamson P et al. Long-Term Outcomes in Patients With Type 2 Myocardial Infarction and Myocardial Injury. Circulation 2017; 137(12): 1236-1245.

Paediatric Safety Audit: Identifying Current Challenges and Practical Solutions.

Jasmin Clark

University of Exeter

INTRODUCTION: Patient safety is freedom from unintentional harm caused by preventable factors, and children are more likely to experience medical errors than adults (1). Real-time auditing is shown to improve practice in paediatric environments (2), emphasising the role of maximising safety by identifying shortcomings and proposing solutions.

OBJECTIVE: Collate and analyse paediatric safety data to recommend improvements.

PATIENTS AND METHODS: In a longitudinal audit across 326 admissions to the paediatric department of a hospital in South West England from September 2017 to August 2018, patient safety data was collected in real-time from the paediatric assessment clerking sheet. Collection sheets contained key themes: 1. Documentation and safeguarding, 2. History content, 3. Infection control and antibiotics, and 4. Recording patients' details, observations and growth measurements. Percentage of patient safety meeting required standards was analysed using scatter graphs with linear trendlines, identifying areas to target for development. Run charts were generated for these areas to show progression. Interviews with staff then identified practical solutions to enhance practice.

RESULTS: Theme 1 and 4 were below the 90% target for meeting the set criteria. Specifically, safeguarding checklist completion, Paediatric Early Warning Score (PEWS) documentation, and blood pressure, height and head circumference measurements. However, all themes showed real-time improvement throughout the audit process.

CONCLUSIONS: Staff were uncertain where to document PEWS, therefore clearer guidance and a designated box on the clerking proforma could improve this. Blood pressure, growth measurements and safeguarding checklist completion could become a condition for senior review to increase awareness and incentive amongst staff. Lastly, education on safeguarding requirements, and optimising the checklist position on the proforma could increase completion. Presenting this data at the monthly audit meeting informed staff and generated more recommendations. Future research should audit improvement after implementation.

REFERENCES:
1. The American Academy of Pediatrics. 'Principles of Pediatric Patient Safety: Reducing Harm Due to Medical Care'. *Pediatrics*. 2011;127(6):1473. Available from: http://pediatrics.aappublications.org/content/127/6/1199
2. Lee, L., Girish, S., Van den Berg, E. and Leaf, A. 'Random safety audits in the neonatal unit'. *Archives of Disease in Childhood- Fetal and Neonatal Edition*. 2009;94(2):116- 119. Available from: https://fn.bmj.com/content/fetalneonatal/94/2/F116.full.pdf

Secukinumab Significantly Improves Disease Indices in Psoriatic Arthritis and Ankylosing Spondylitis within NHS Tayside Cohort

SJ Cooper, S Bhat

University of Dundee

INTRODUCTION: Secukinumab1-5 (Cosentyx) is a novel fully humanised mAb. It has been introduced into NHS Tayside for treatment of psoriatic arthritis (PsA) and ankylosing spondylitis (AS). PsA is the rheumatological manifestation of psoriasis. AS3,6–9 is characterised by inflammation and osteogenesis of the axial spine, presenting as sacroiliitis and spondylitis. IL-17A has been implicated in the pathogenesis of AS and PsA.

PATIENTS AND METHODS: A paired t-test was used to compare disease indices. Results were compared to the last previous set of disease indices prior to commencing Secukinumab.

RESULTS: There were 36 patients with PsA in NHS Tayside prescribed Secukinumab. In PsA at 3 and 6 months, there was a significant decrease ($t(22)=4.01$, $p=0.001$) in swollen joints from an average of 5.4 before Secukinumab to 1.0 after (81.6% decrease). Tender joints also significantly decreased ($t(22)=2.58$, $p=0.015$) from 9.1 joints to 3.2 (65.1% decrease). 4 patients out of 36 (11.11%) experienced side effects. In AS, 13 patients with documented AS who were prescribed Secukinumab. At 3 and 6 months there was a significant decrease ($t(9)=5.01$, $p=0.001$) in the total BASDAI score from an average of 6.8 before Secukinumab to 3.4 after (49.7% decrease). 1 patient (7.7%) experienced side effects of fluid filled blisters in their mouth.

CONCLUSIONS: This study provides evidence of the benefit of Secukinumab in PsA and AS within the NHS Tayside. It was effective at 3 and 6 months in both conditions and showed a highly significant improvement in disease indices. The tolerability was also good, with few patients reporting any side effects.

REFERENCES:

1. Chen K, Kolls JK. Interleukin-17A (IL17A). Gene 2017;614:8–14. 2. Mease PJ, McInnes IB, Kirkham B, Kavanaugh A, Rahman P, van der Heijde D, Landewé R, Nash P, Pricop L, Yuan J, Richards HB, Mpofu S. Secukinumab Inhibition of Interleukin-17A in Patients with Psoriatic Arthritis. New England Journal of Medicine 2015;373:1329–39. 3. Blair HA, Dhillon S. Secukinumab: A Review in Ankylosing Spondylitis. Drugs 2016;76:1023–30. 4. Shirley M, Scott LJ. Secukinumab: A Review in Psoriatic Arthritis. Drugs 2016;76:1135–45. 5. Amatya N, Garg A V, Gaffen SL. IL-17 Signaling: The Yin and the Yang. Trends in Immunology 2017;38:310–22. 6. Wei JCC, Baeten D, Sieper J, Deodhar A, Bhosekar V, Martin R, Porter B. Efficacy and safety of secukinumab in Asian patients with active ankylosing spondylitis: 52-week pooled results from two phase 3 studies. International Journal of Rheumatic Diseases 2017;20:589–96. 7. Braun J, Baraliakos X, Deodhar A, Baeten D, Sieper J, Emery P, Readie A, Martin R, Mpofu S, Richards HB. Effect of secukinumab on clinical and radiographic outcomes in ankylosing spondylitis: 2-year results from the randomised phase III MEASURE 1 study. Annals of the Rheumatic Diseases 2017;76:1070–7. 8. Baeten D, Sieper J, Braun J, Baraliakos X, Dougados M, Emery P, Deodhar A, Porter B, Martin R, Andersson M, Mpofu S, Richards HB. Secukinumab, an Interleukin-17A Inhibitor, in Ankylosing Spondylitis. New England Journal of Medicine 2015;373:2534–48. 9. Burkett PR, Kuchroo VK. IL-17 Blockade in Psoriasis. Cell 2016;167:1669.

Assessing Radiological Union Following First Metatarsophalangeal Joint Arthrodesis Using Memory Staples

Fayez Elsawy, Ioannis Papachristos, Rakesh Dalal

University of Manchester Medical School

INTRODUCTION: First metatarsophalangeal (MTP) joint arthrodesis is a surgery indicated in treating various pathologies of the foot. The use of memory staples as a method of fusion has produced successful rates of bony union.

PATIENTS AND METHODS: We aimed to assess successful bony union rates and complications associated with first MTP joint fusion using memory staples. Electronic records of clinical notes and X-rays were used to collect data retrospectively of patients with at least 3 months follow up undergoing first MTP arthrodesis using memory staples from June 2017 to February 2019 at Stepping Hill Hospital, Stockport NHS Foundation Trust.

RESULTS: 92 patients (76% female) with a mean age of 63.1+11.9years underwent 97 first MTP joint fusions. 95.9% (n=93) of the operations resulted in successful union, with 3 operations resulting in non-unions (3.1%) and a single malunion (1.0%). The mean time taken for successful union was 61.0+21.6days with the maximum length of time being 118 days. 87.6% (n=85) of operations resulted in no complications. Of the 12 reported complications, 58.3% (n=7) were due to metalwork related pain.

CONCLUSIONS: These results show the use of memory staples is effective in achieving high rates of bony union within 3 months of operation, with minimal complication rates

A retrospective study of isolated terminal Ileitis on small bowel capsule endoscopy and its clinical significance

Dilini A Fernando, Diana Yung, Anastasios Koulaouzidis, John N Plevris

Medical School, University of Edinburgh

INTRODUCTION: Small bowel capsule endoscopy (SBCE) often picks up isolated terminal ileal inflammation (TI-itis). However the clinical significance is often unclear. Studies examining the progression of terminal ileitis are rare[1]. Therefore, we aimed to characterise the outcomes of a cohort of patients at our tertiary care centre with isolated TI-itis on SBCE.

PATIENTS AND METHODS: We examined patients who underwent SBCE at our tertiary care centre between June 2009-December 2017. We included patients with isolated TI-itis on SBCE. Exclusion criteria were patients with inflammatory lesions (ulcers, aphthae, mucosal oedema, stenosis) elsewhere in the small bowel (SB) or colon, previously diagnosed inflammatory bowel disease (IBD) and patients for whom insufficient data were available. Data were gathered on SBCE indications and findings, other investigations, faecal calprotectin (FC) levels at time of SBCE and outcomes from the patient's electronic records.

RESULTS: Over the study period 66/1967(3.4%) patients undergoing SBCE were identified to have isolated TI-itis. 32 were excluded due to insufficient data; 34 were analysed. 17 males, median age 44 years (range 15-80). Indications for SBCE were: query IBD (n=22), SB bleeding (n=11). Eventual diagnoses for patients with TI-itis were 9(26.5%) patients with IBD based on subsequent

leocolonoscopy and biopsies, 7(20.5%) had a functional gut disorder, 5(14.7%) had medication-induced SB inflammation (3 nicorandil-related, 1 NSAID-related, 1 methotrexate-related), 1 patient had SB bacterial overgrowth and 1 patient had TI angioectasia. 6(17.6%) patients remained without a definitive diagnosis over the followup period. 5(14.7%) patients remained under investigation at the time of writing. Data on FC were available on 26 patients. Mean FC in patients with an eventual diagnosis of IBD was 584±347, compared to 256.6±331 in patients without IBD who were not further investigated (p=0.02).

CONCLUSIONS: In our group 1/3 of patients with isolated TI-itis on SBCE were eventually diagnosed with IBD. The mean FC in patients with isolate TI-itis eventually diagnosed with IBD was significantly higher. SBCE is a valuable tool to aid the diagnosis of SB inflammation, especially when the inflammatory changes are more subtle and may be missed on ileocolonoscopy.

REFERENCES: [1] Tse C, Deepak P, Smyrk T, Raffals L. Isolated Acute Terminal Ileitis Without Preexisting Inflammatory Bowel Disease Rarely Progresses to Crohn's Disease. Digestive Diseases and Sciences. 2017;62(12):3557-3562.

Proteolysis Targeting Chimaera (PROTAC)-mediated Aurora kinase A degradation as a novel therapeutic strategy for cancer

Alex Fung, Richard Wang, Camilla Ascanelli, Catherine Lindon

University of Cambridge School of Clinical Medicine

INTRODUCTION: Uncontrolled cellular proliferation is a hallmark of cancer and therapies targeting pathways that initiate and drive cell division are used to treat various cancers. Microtubule poisons, such as paclitaxel, work by disrupting mitotic spindle microtubule dynamics, but are limited by resistance and side effects such as peripheral neurotoxicity due to their activity in non-dividing cells. To address this, next-generation antimitotic drugs targeting mitosis-specific kinases are being developed. Aurora kinase A (AurKA) is a key mitotic regulator implicated in oncogenic transformation and tumour progression, particularly in neuroblastoma. However, the AurKA inhibitor MLN8237 has shown disappointing clinical efficacy1. Proteolysis Targeting Chimaeras (PROTACs) are an emerging drug modality that harnesses the ubiquitin-proteasome system to degrade disease-causing proteins. We characterised the antimitotic activity of a novel MLN8237-based PROTAC called PROTAC D, comparing it with that of MLN8237.

PATIENTS AND METHODS: Cytotoxicity assays were performed for PROTAC D and MLN8237 in 2OS, HeLa and SHSY5Y cells. Mitotic cell fate profiles were constructed using time-lapse differential interference contrast microscopy to characterise the effect of PROTAC D on mitotic progression in U2OS cells. AurKA degradation, as well as effects on N-Myc and c-Myc protein levels, were quantified by Western blotting.

RESULTS: PROTAC D exhibited greater cytotoxicity than MLN8237 in all cell lines, with IC50 values up to 32-fold lower than those of MLN8237. PROTAC D enhanced the cytotoxicity of paclitaxel in HeLa cells by 25%. In U2OS cells, PROTAC D prolonged mitosis, promoted post-mitotic death and acted synergistically with paclitaxel to induce cell death. PROTAC D induced mitotic cell death in arrested U2OS cells with lower induction of mitotic slippage than MLN8237. PROTAC D reduced AurKA levels but did not affect N-Myc or c-Myc levels in SK-N-BE(2) and HeLa cells, respectively.

CONCLUSIONS: Our results show that PROTAC D-induced AurKA degradation produces superior cytotoxic and antimitotic effects to MLN8237-induced AurKA inhibition. PROTAC D acts

synergistically with paclitaxel, mirroring the efficacy of AurKA inhibition and paclitaxel as a targeted combination therapy for other cancers. Our results demonstrate that PROTACmediated protein degradation is a promising approach for targeting AurKA and should reinvigorate interest in AurKA and other mitosis-specific kinases as safer and more effective antimitotic targets for cancer therapy.

REFERENCES: 1. O'Connor, O.A., Özcan, M., Jacobsen, E.D., Roncero Vidal, J.M., Trotman, J., Demeter, J., Masszi, T., Pereira, J., Ramchandren, R., d'Amore, F.A., Foss, F., Kim, W.-S., Leonard, J.P., Chiattone, C.S., Zinzani, P.L., Liu, H., Jung, J., Zhou, X., Leonard, E.J., Dansky Ullmann, C., Shustov, A.R., 2015. First Multicenter, Randomized Phase 3 Study in Patients (Pts) with Relapsed/Refractory (R/R) Peripheral T-Cell Lymphoma (PTCL): Alisertib (MLN8237) Versus Investigator's Choice (Lumiere trial; NCT01482962). Blood 126, 341–341.

Leibovich score is the optimal clinical-pathological system to predict recurrence of nonmetastatic clear-cell renal cell carcinoma

Blackmur JP, Gaba F, Fernando D, Williams S, McNeill A, Stewart GD, Leung S, Laird A.

University of Edinburgh

INTRODUCTION: Various post-operative prognostic systems are used to predict recurrence of clear-cell renal cell carcinoma (ccRCC), however superiority of a particular system has yet to be established. This study aims to compare: T-stage, Nuclear Grade, Kattan, Leibovich, UISS and SSIGN.

PATIENTS AND METHODS: 542 non-metastatic ccRCC-patients treated with radical or partial nephrectomy, from 2008-2017, were retrospectively reviewed. The primary outcome is Recurrence Free Survival (RFS), with secondary outcomes Cancer Specific Survival (CSS) and Overall Survival (OS). Scoring systems were assessed by Kaplan-Meier, Cox-regression and Receiver Operative Characteristic (ROC).

RESULTS: All systems were significantly associated with RFS, CSS and OS by Kaplan-Meier and univariable Cox-regression. Multivariable Cox-regression identified that Leibovich was the only scoring system significantly associated with RFS (HR 1.59, 95% CI 1.22-2.06, p=0.0005). UISS was the only system significantly associated with CSS (HR 1.89, 95% CI 1.05-3.41, p=0.04) and OS (HR 2.46, 95% CI 1.61-3.75, p=2.85e-5). Using ROC curves, Leibovich had a significantly higher AUC (0.87) for 5-year RFS compared to T-stage (AUC=0.77,p=8.29e-7), tumour grade (AUC=0.78,p=1.20e-5), UISS (AUC=0.72,p=1.27e-8) and Kattan (AUC=0.71,p=1.82e-10) but was not significantly different to SSIGN (AUC=0.86,p=0.22). Similar results were found for 5-year CSS and OS predictions. A novel combination of Leibovich and ECOG significantly improved 5yr OS prediction (Leibovich- ECOG AUC = 0.78, Leibovich AUC = 0.74, p=0.001), without affecting 5yr RFS prediction (Leibovich-ECOG AUC 0.87, Leibovich AUC 0.87,p=0.75).

CONCLUSIONS: Leibovich may be better for predicting RFS, however UISS may be better for predicting CSS and OS. Combination of Leibovich and ECOG may improve OS prediction, however validation is required.

Evaluation of Body Composition and Anthropometry in Children with Osteogenesis Imperfecta

M. Gilani, S. Shepherd, K. Gerasamidis, J. Wong, H. McDevitt, S. F. Ahmed, A. Mason

University of Glasgow

INTRODUCTION: Osteogenesis Imperfecta (OI) is a skeletal disorder characterised by a predisposition to recurrent fractures and bone deformities. Clinically OI is defined by features such as short stature, however, less is known regarding body composition. This study was a crosssectional analysis of children with OI.

AIM:
• Describe body composition and anthropometry in a paediatric OI population

PATIENTS AND METHODS: 39 children (21 males) with OI attending the Bone service at the Royal Hospital for Children Glasgow were included; who had a dual-energy x-ray absorptiometry (DXA) scan performed, 2015-2018. Sillence classification was used to categorise subjects into types IIV. Height and body-mass-index (BMI), recorded at the date of DXA, were converted to standard deviation scores (SDS) using UK population references. DXA-derived lean mass and fat mass were used to generate lean-mass-index (LMI) and fat-mass-index (FMI) by dividing the covariates by height squared. LMI and FMI were converted to SDS using DXA data from 198 local healthy children. Results were expressed as median (range). Mann Whitney was used for all comparisons of OI with healthy control groups and between type I and types III/IV. Statistical significance was deemed at a p-value of <0.05.

RESULTS: The median age of the group was 11.95 (4.9, 18.3). Median height SDS was -1.06 (-3.64, 1.62) which was significantly lower than the healthy population ($p<0.0001$). Median BMI SDS was -1.38 (-2.31, 2.95), and was not significantly different from the healthy population ($p=0.53$). Median LMI SDS was -2.51 (-6.94, 0.77), and was significantly lower than the healthy population ($p<0.0001$) where 62% (24/39) had an SDS below -2.0. Median FMI SDS was 0.67 (-0.45, 2.72), which was significantly higher than the normal population ($p<0.0001$); where 10% (4/39) had an SDS above +2.0. No significant differences were found between the subtypes. No associations were found with age nor bisphosphonate treatment.

CONCLUSIONS: A contemporary population of children with OI present with significant reduction in height and deficits in lean mass but relatively preserved fat mass. The results of this study point towards a possible need for implementation of methods to improve muscle mass in this paediatric population. Exercise programmes or targeted physiotherapy can aim to improve muscle function; have indirect benefits on bone strength; as well as improve cardiovascular and metabolic health in these patients, leading to an improvement in long term health and quality of life.

Investigating the Pharmacogenetics of Anti-TNF Response in Patients with Rheumatoid Arthritis Utilising the Re-weighted Disease Activity Score: Results from the Biologics in Rheumatoid Arthritis Genetics and Genomics Study Syndicate (BRAGGSS)

Syed Gilani, Darren Plant, Anne Barton, James Bluett

University of Manchester

INTRODUCTION: Anti-TNF drugs have revolutionised the treatment of rheumatoid arthritis (RA), but response is not universal. Genome-wide association studies (GWAS) have identified single nucleotide polymorphisms (SNPs) associated with treatment response. Unfortunately, many SNPS fail to be subsequently validated in independent studies. Response is measured using the disease activity score 28 (DAS28) which contains subjective measures (visual analogue score; VAS and tender joint count; TJC) that are influenced by confounding factors such as depression. This study used a reweighted DAS28 score that excludes the VAS and TJC to determine whether previously associated

SNPs are associated with response to anti-TNF medications when compared to the original DAS28 in a prospective UK RA cohort of anti-TNF starters.

PATIENTS AND METHODS: A literature review was conducted to identify SNPs with previous evidence of anti-TNF response discovered using a GWAS approach (P<10-5 or P<10-3 with validation in an independent cohort). Patients commencing anti-TNF therapy were recruited to the multicentre observational BRAGGSS study (n=1828). Clinico-demographic data were recorded at baseline and 6 months, including swollen and tender joint count, ESR or CRP and VAS and the original and reweighted DAS-28 were calculated. Treatment response was measured by change in DAS28 at 6 months, using the original and reweighted formulas. Donated samples underwent whole-genome genotyping. Linear regression analysis was conducted to investigate SNPs associated with change in DAS-28/re-weighted DAS, adjusting for baseline values using Plink 1.07.

RESULTS: Of the 36 SNPs previously associated with anti-TNF response, data for 26 were available for analysis after quality control. Using the original DAS28, at 6 months post anti-TNF initiation, one SNP was significantly associated with treatment response (rs12081765). Using the reweighted DAS28, five were significantly associated (P≤0.05) (Table 1).

CONCLUSIONS: More genetic associations were discovered when using the reweighted DAS28 which may reflect the exclusion of subjective measures. Further studies using larger independent patient cohorts are needed to validate these findings.

Should surgeons in training engage in research? Medical student perspectives

Henry Grainger, Camelia Yousefpour, Dr James Ashcroft

University of Manchester

INTRODUCTION: A topical argument frequently encountered between surgeons in training is: should clinical doctors and surgeons engage in research? Research skills are often not formally taught in the UK undergraduate medical course but may be essential to the qualified clinical doctor and surgeon.

PATIENTS AND METHODS: 19 undergraduate medical students participated in a live quantitative and qualitative focus group at the Royal Preston Hospital, Lancashire, UK in order to assess medical student perspectives on research as both a medical student and doctor in training. 10 questions were formulated based initially on the GMC's framework for professional capabilities for postgraduate clinical doctors and then expanded for further insight.

RESULTS: Despite valuing participation in research as a component of becoming a safe doctor, the majority of medical student have had limited engagement in research due to a number of factors. The most significant factor highlighted throughout the study was a lack of effective supervision from senior clinicians and/or university bodies.

CONCLUSIONS: This study has identified a need for improved medical student research engagement and offers potential avenues to inspire a new generation of research enthused doctors and surgeons.

REFERENCES:

1. Zemlo TR, Garrison HH, Partridge NC, Ley TJ. The Physician-Scientist : Career Issues and Challenges at the Year 2000. 2000.
2. Walkington H. Students as researchers : Supporting undergraduate research in

the disciplines in higher education.
3. Aslam F, Shakir M, Qayyum MA. to the Future of Research in South Asia. 2005;2(11):1110-1111. doi:10.1371/journal.pmed.0020322.
4. Houlden RL, Raja JB, Collier CP, et al. Medical students ' perceptions of an undergraduate research elective Medical students ' perceptions of an undergraduate research elective. 2009. doi:10.1080/01421590400019542.
5. Diez C, Arkenau C, Meyer-wentrup F. The German Medical Dissertation — Time to Change ? 2000:861-863.
6. Kohlert S, Zuccaro L, McLean L, Macdonald K. Does medical school research productivity predict a resident's research productivity during residency? J Otolaryngol - Head Neck Surg. 2017;46(1):1-7. doi:10.1186/s40463-017-0202-6.
7. GMC. Generic Professional Capabilities. GMC Publ. 2013;(November). doi:10.1136/ip.2010.029215.56.
8. GMC. Medical student-selected components (SSCs). 2009.
9. BMA. Intercalated degrees. https://www.bma.org.uk/advice/career/studyingmedicine/intercalated-degrees. Published 2018. Accessed September 16, 2018.
10. Sherwin T. THE NEW ZEALAND career profiles. 2014;(June).
11. Lowell M. Ten Common Misunderstandings , Misconceptions , Persistent Myths and Urban Legends about Likert Scales and Likert Response Formats and their Antidotes. 2007;3(3):106-116.

The prognostic value of anticholinergic burden measures in relation to mortality in older individuals: a systematic review

Ms. Katherine Graves-Morris, Dr. Carrie Stewart, Dr. Roy L. Soiza, Dr. Martin Taylor-Rowan, Dr. Terence J Quinn, Prof. Yoon K Loke, Prof. Phyo Kyaw Myint

University of Aberdeen

INTRODUCTION: It has been suggested that greater anticholinergic burden (ACB) from medications increases the risk of mortality in older individuals, yet significance and strength of this association varies between studies [1][2]. Multiple measures exist to quantify ACB, however no evidence yet exists comparing individual measures in relation to the outcome of mortality. Therefore, the aim of this systematic review is to assess the prognostic utility of ACB-specific measures on mortality in older individuals.

PATIENTS AND METHODS: The following PROSPERO-registered systematic review was conducted in accordance with PRISMA guidelines. A literature search was conducted in MEDLINE (Ovid), EMBASE (Ovid), PsycINFO (Ovid) and CINAHL (EBSCO) from 2006-2018. Observational studies assessing the association between ACB and mortality which utilised ≥1 ACB measure, involving exclusively individuals aged ≥65 years, were included. Data were analysed narratively, using meta-analysis techniques where appropriate.

RESULTS: Twenty published studies including 18 cohorts and 498,056 older individuals assessed this association and were eligible to be included. Eight anticholinergic-specific measures were identified, of which the most frequent were the ACBS (Anticholinergic Cognitive Burden Scale; 9 studies) and the ARS (Anticholinergic Risk Scale; 8 studies). Meta-analysis for the ACBS indicated small but significant effect sizes when stratified into anticholinergic exposure levels (Low ACB: HR 1.39 (95%CI 1.1-1.75) / OR 1.53 (95%CI 1.34-1.75); High ACB: HR 1.47 (95%CI 1.19-1.81) / OR 1.37 (95%CI 1.12-1.68)). Meta-analysis for the ARS comparatively indicated smaller effect sizes, partly exhibiting no

effect (Low ACB: HR 1.15 (95%CI 1.08-1.22) / OR 1.07 (95%CI 0.68-1.68); High ACB: HR 1.14 (95%CI 1.06-1.22) / OR 0.81(95%CI 0.3-2.16)).

CONCLUSIONS: There was a modest association between several anticholinergic risk measures and mortality, with the most evidence for ACBS. However, studies directly comparing different measures were lacking. Identifying the ACB measure with the highest prognostic utility would require direct comparisons of multiple, previously-validated ACB measures in large-scale cohorts.

REFERENCES: [1] Fox C, Smith T, Maidment I, Chan WY, Bua N, Myint PK, Boustani M, Kwok CS, Glover M, Koopmans I, Campbell N. Effect of medications with anti-cholinergic properties on cognitive function, delirium, physical function and mortality: a systematic review. Age and ageing. 2014 Jul 19;43(5):604-15. [2] Ruxton K, Woodman RJ, Mangoni AA. Drugs with anticholinergic effects and cognitive impairment, falls and all-cause mortality in older adults: a systematic review and metaanalysis. British journal of clinical pharmacology. 2015 Aug 1;80(2):209-20.

Introduction of an 'Antibiotic Review Kit' in an Acute Medical Unit

Eoin Gravestock

University of Edinburgh

INTRODUCTION: Antibiotic resistance is a growing public health problem worldwide. To tackle this, antibiotic stewardship interventions are being widely introduced to promote effective use of antibiotics in hospitals.

PATIENTS AND METHODS: A quality improvement study of patients receiving antibiotics in the Acute Medical Unit, Western General Hospital. Baseline use of antibiotics in the department was evaluated, including common indications and routes of administration. Antibiotic Stewardship was compared before (n = 114) and after (n=116) the introduction of a two-part 'Antibiotic Review Kit': education in the department; as well as an antibiotic sticker for drug Kardex's.

RESULTS: The most common indications for antibiotic prescriptions in AMU were for infections of the respiratory and urinary tracts, accounting for 66% of total antibiotic prescriptions. Documentation at initial prescription improved after intervention by a statistically significant margin ($p < 0.05$). Rate of 72-hour review remained the same for both periods, but above the 90% target. The intervention appeared to improve compliance with local guidelines, however this was not found to be statistically significant ($p > 0.05$).

CONCLUSIONS: Introduction of an Antibiotic Review Kit improved antibiotic stewardship in the AMU – with improvements in documentation of prescriptions and compliance with guidelines. The department were performing excellently in terms of 72-hour review of prescriptions both before and after intervention.

Sleep Disorders in Multiple Sclerosis (MS)

Hamish Clark

Barts and The London Medical School

INTRODUCTION: A high proportion of patients with MS report sleep disturbance and daytime fatigue. It is of the utmost importance to identify and diagnose sleep disorders in this population early so that patients can receive the appropriate treatment. This project set out to:
• Characterise sleep disorders in patients with MS
• Investigate the effects of smartphone usage on sleep
• Examine whether a smartphone sleep monitoring application could be used as a screening tool to diagnose sleep disorders

PATIENTS AND METHODS:
Literature reviews on:
• Sleep disorders in MS (34 articles included)
• Smartphones and sleep (25 articles included)

RESULTS: Sleep Disorders in MS Causes include oxidative stress & inflammation, psychiatric illness, physical inactivity, nocturnal urinary disorders and prescription side effects. Prevalence is ~ x4 higher than the general population1; up to 70% of patients have ≥1 sleep disorder2. Important disorders include insomnia, restless legs syndrome, periodic limb movement disorders and sleep-related breathing disorders. Complications include cognitive impairment, psychiatric illness, chronic pain and higher disability status.

Smartphone Usage and Sleep Bedtime and night time smartphone usage and excessive screen time negatively impact sleep duration and quality. The mechanisms include a reduction in melatonin levels, increase in alertness and a delay of the circadian clock3. Complications include daytime fatigue and depression. Smartphone sleep monitoring applications have value in raising awareness about the importance of sleep but are currently of limited clinical utility.

CONCLUSIONS: There is a significant unmet clinical need in the MS population for improvement in the diagnosis and management of sleep disorders. Certain patterns of smartphone usage adversely affect sleep. Smartphone sleep monitoring applications are not currently useful as a screening tool for sleep disorders. Future work is to investigate the use of wrist actigraphy as a screening tool.

REFERENCES:
1. Garland, S. N., Scurrey, S. R. M., Ploughman, M. & Health, Lifestyle and Aging with MS Canadian Consortium. Factors Associated with Poor Sleep in Older Adults with Multiple Sclerosis. *Int. J. Behav. Med.* **24**, 937–945 (2017).
2. Brass, S. D., Li, C.-S. & Auerbach, S. The underdiagnosis of sleep disorders in patients with multiple sclerosis. *J. Clin. Sleep Med.* **10**, 1025–1031 (2014).
3. Hoshikawa, M., Uchida, S. & Hirano, Y. A Subjective Assessment of the Prevalence and Factors Associated with Poor Sleep Quality Amongst Elite Japanese Athletes. *Sports Med Open* **4**, 10 (2018).

Harnessing students as collaborators in a national audit: experiences from the Plymouth intercalated BSc in Urgent & Emergency Care.

Meghan Hallatt, Max Sugarman, Evangeline Letch, Ellen Macpherson, Reddin Ahmad, Eleanor Van der Zanden, Sarah Aspland, Lorraine Pinto, Dr Hamza Malik, Dr Blair Graham, Pam Nelmes

Lancaster Medical School

INTRODUCTION: Since 2005 the University of Plymouth (UoP) has offered an intercalated Bachelor of Science degree in Urgent and Emergency Care (iBScUEC). This degree requires students to complete a nine month placement in an emergency department (ED), leading to the creation of a UK-wide network of students embedded in EDs (n=37 for the 2018/2019 academic year). With permission of UoP faculty, iBScUEC students were approached by an Academic Clinical Fellow from the South West of England (HM) and invited to participate in a multi-centre retrospective case-notes audit of distal radius fracture (DRF) management. This poster evaluates students' involvement in this project, and quantifies the impact of a single network of intercalated medical students for facilitating multi-centre data collection.

PATIENTS AND METHODS: Student involvement was prospectively agreed with UoP faculty and placement mentors. Local audit registration was performed by students in each participating trust. Data was collected from all patients over 17 years of age, presenting with a Colles' type DRF during the two-week study period, with additional six week follow-up. Data were stored securely and anonymised prior to submission to the research lead.

RESULTS: 12/37 (32.4%) students participated in the project. An additional ten EDs throughout the UK were included as a result of iBScUEC student involvement. A total of 29,737 patients were screened by students. This led to the identification of an additional 51 patients meeting inclusion criteria, representing 57% of the final study population.

CONCLUSIONS: The iBSc student cohort successfully increased recruitment to a multi-centre audit resulting in a more representative impression of national practice than would otherwise have been possible. This data will inform future research to address a key RCEM/James Lind Alliance research priority. This small scale assessment of undergraduate involvement in a single national audit suggests the potential of harnessing motivated students as collaborators, with mutual benefits to students and investigators.

Incidence and management of diabetic ketoacidosis in children with type 1 diabetes mellitus

NAEE Hanna, RM Williams, AEJ Hendriks

Cambridge University

INTRODUCTION: Our aims are: To analyse incidence of diabetic ketoacidosis (DKA) over time in children with type 1 diabetes mellitus (T1DM). To audit compliance with 2015 NICE guidelines on DKA management in children with T1DM.

PATIENTS AND METHODS: Audit of children <16 years of age with T1DM in a single academic centre. DKA admissions were identified from electronic records. Data was collected from 01/01/2011 until 31/12/2012 and from 01/01/2017 until 31/12/18. Pearson Chi-Square test compared DKA incidence between time periods. Local DKA guidelines were updated in July 2016. Audit data was therefore collected between 01/08/2016 and 31/12/2018. DKA management was evaluated by 6 standards:

DKA diagnosis, estimation of dehydration, fluid calculation, intravenous fluid type and insulin dose and timing.

RESULTS: A total of 612 children were included, 283 in 2011/12 and 329 in 2017/18. There were 81 and 73 hospital admissions in 2011/12 and 2017/18, respectively. There was a significant decrease in admissions for DKA from 25 (31%) admissions in 2011/12 to 11 (15%) admissions in 2017/18 (p=0.02). There was no difference between time periods in whether DKA admissions were at diagnosis of T1DM (15 (60%) in 2011/12; 8 (73%) in 2017/18). Between 01/08/2016 and 31/12/2018, 371 children were audited. Seventeen admissions for DKA out of 91 total hospital admissions (19%) were included. Newly diagnosed T1DM accounted for 33 (36%) admissions, hypo- and hyperglycaemia for another 17 (19%) and 24 (26%) admissions were due to other reasons. DKA diagnosis was appropriate in 17/17 (100%) admissions. Estimation of dehydration was correct in 16/17 (94%) admissions. Fluid requirement calculation was accurate in 16/17 (94%) admissions. Appropriate intravenous fluids were started in 16/17 (94%) admissions. The correct intravenous insulin dose was given in 16/17 (94%) admissions, and this was started >1 hour after starting intravenous fluids in 16/17 (94%) admissions. Overall, only 12/17 (71%) admissions were fully managed according to DKA guidelines on these key standards.

CONCLUSIONS: DKA admission incidence has significantly decreased in our hospital in 2017/18 compared to 2011/12. Compliance with DKA guidelines on management was suboptimal and further education of healthcare professionals is required.

Managing fever in infants aged ≤6 months with negative cultures at 48h: an audit of clinical practice at Royal Aberdeen Children's Hospital

Sandra Hapca, Dr. Florencia Marconi, Prof. Stephen Turner

Aberdeen University School of Medicine, Medical Sciences & Nutrition

INTRODUCTION: Fever in infants can be caused by various aetiologies from self-limiting viral infection to life-threatening sepsis. Compared to older age groups, infants aged ≤6 months present non-specifically early in the course of a febrile illness and can become rapidly unwell before an infection focus is identified. Current National Institute for Health and Care Excellence (NICE) guidelines advocate antibiotic therapy for all feverish infants aged ≤1 month, aged 1-3 months with abnormal white blood count (WBC) and aged >1 month who appear unwell (1). The recommended antibiotic is a third-generation cephalosporin with added *Listeria* cover in infants aged ≤3 months (1). We aimed to audit the treatment of infants aged ≤6 months with fever at Royal Aberdeen Children's Hospital.

PATIENTS AND METHODS: Case notes of infants who presented to Paediatric Assessment Unit between 01.01.2017 and 30.06.2018 were retrospectively reviewed against inclusion criteria for age ≤6 months and fever ≥ 38oC. Data was collected using a form with pre-specified criteria including patient age, gender, date of admission, temperature, paediatric early warning system (PEWS) score, sepsis 6 score, symptoms, investigations and treatment. Data was input into and analysed using Microsoft Excel©.

RESULTS: Of the 123 case notes reviewed, 40 met inclusion criteria and were included in analysis. 29 infants received antibiotics and 11 did not. All infants aged ≤1 month (n=5) received antibiotics demonstrating 100% compliance with the guideline. 8 infants aged 1-3 months with abnormal WBC (n=9) received antibiotics demonstrating 88.9% compliance rate. In the remaining cases, decision for antibiotic therapy was based on clinical judgement and preliminary investigation results. There were

no differences in age, temperature, PEWS score, sepsis 6 score or WBC between the antibiotic treated and non-antibiotic treated groups. In the antibiotic treated group, of 111 cultures, 7 were positive for viral and 5 for bacterial growth. In the non-antibiotic treated group, of 14 cultures, 5 were positive for viral and 1 for bacterial growth. The most commonly used antibiotic in infants aged >3 months (n=10) was cefotaxime (9) followed by cefotaxime and gentamicin (1) demonstrating 100% compliance with guidelines. The most commonly used antibiotic in infants aged ≤3 months (n=19) was also cefotaxime (16) followed by a combination of cefotaxime and amoxicillin (2) or benzylpenicillin (1) demonstrating a 10.5% compliance rate. The course of antibiotic therapy in the culture positive group was 43.3 hours with 37.8 hours for viral and 57.6 hours for bacterial positivity. The course of antibiotic in the culture negative group was 54 hours.

CONCLUSIONS: In conclusion, the decision to start antibiotic therapy in feverish infants aged ≤1 month and those aged 1-3 months with abnormal WBC was mostly consistent and in line with NICE guidelines. In infants aged >3 months, the decision to start empirical antibiotic therapy was subject to clinical judgment and supported by a period of in-hospital observation with or without investigations as per guideline recommendations. Once decided on, the choice of antibiotic in infants aged >3 months was within NICE guidelines with cefotaxime being the first line option. Antibiotic therapy in infants aged ≤3 months was outwith NICE guidelines as only a minority received *Listeria* cover. This reflects a discrepancy between NICE and Grampian guidelines.

REFERENCES:

1. National Institute for Health and Care Excellence (2017). Fever in under 5s: assessment and initial management (NICE Guidelines CG160). Available at https://www.nice.org.uk/guidance/cg160 (Accessed: 21 Sept 2019).

Suggestions for the improvement of patient knowledge during hospital stays as defined by SAFER

Emily Heaton, Lauren Brown, Mohammad Abumattar, Haran Makwana

Hull York Medical School

INTRODUCTION: SAFER is a concept that blends five different elements of best practice with the aim of increasing patient flow through the hospital, thus reducing length of stay. If implemented effectively, the theory is that it will improve clinical outcomes and increase patient safety. An aspect of the framework is four key questions every patient should know the answer to, and which should be discussed every day at a board or ward round, these are:
1) What is wrong with me? (main diagnosis)
2) What is going to happen today? (tests, interventions etc)
3) What is needed to get me home? (clinical criteria for discharge)
4) When am I going to go home? (estimated discharge date)
These questions were the focus of our study.

PATIENTS AND METHODS: This qualitative study, completed on two different wards at Scarborough General Hospital, had three separate components: assessing whether the four questions were discussed for each patient during the daily board round; determining whether patients knew the answers to the four questions (via a questionnaire); and inspecting the patients' notes to see if the information pertaining to the questions was present.

RESULTS: For all three components of the study there was incomplete discussion of, and patient notes regarding, the answers to the four key questions. During the board round there was incomplete discussion of the four questions, and a lack of consistency between the nurses delivering the information. The information that patients knew also greatly varied and very few patients knew all the answers. In the patient notes, main diagnosis and tasks to be completed that day were present in 100% of cases however the clinical criteria for discharge and estimated discharge date were absent universally. Furthermore, a process map demonstrating the flow of information through the ward was created. This allowed us to identify the potential areas which could be altered in order to improve patient knowledge of the four key questions.

CONCLUSIONS: Despite SAFER being implemented into this Trust in 2016, there are still gaps in patient knowledge precipitated by a lack of communication regarding the four questions during the board round and in the patient notes. Progress is required to achieve the goals outlined in the framework. We feel that the focus should be on a clear format for board rounds and a change in the approach to creation of patient notes, for example, having a dedicated sheet to record such information. Working in partnership with staff on each ward and incentives for change may further encourage the necessary improvements required.

REFERENCES: 1) NHS Improvement (NHSI). Rapid Improvement Guide to: The SAFER Patient Flow Bundle [Internet]; date unknown [cited 30th September 2019]. Available from https://improvement.nhs.uk/documents/633/the-safer-patient-flow-bundle.pdf

Visualising Cerebral Small Vessel Disease in Retinal Fundus Images Using VAMPIRE – A Pilot Study

Sorcha Heelan, Kirstie Hetherington, Graciela Muniz Terrera, Sarah McGrory, Tom MacGillivray

Edinburgh Medical School

INTRODUCTION: Cerebral small vessel disease (cSVD), which has increasing prevalence with age, results in a spectrum of cognitive impairment, ranging from age-related cognitive decline to dementia1. Direct imaging of cerebral microvasculature for cSVD diagnosis and/or risk stratification is unavailable due to insufficient resolution of neuroimaging tools such as MRI2. Therefore, there lacks an efficient, accurate way to quantify the extent of cSVD within patients who could then receive preventative, potentially disease-modifying therapies. Due to the homology of retinal and cerebral microvasculature3, this study investigated whether retinal microvascular changes visualised on fundus camera images have the potential to act as non-invasive biomarkers for cSVD.

PATIENTS AND METHODS: VAMPIRE (Vascular Assessment and Measurement Platform for Images of the REtina) software quantifies retinal microvascular topographical features in retinal fundus images4. In this pilot study, retinal microvascular widths, densities and fractal dimensions (a measure of microvascular branching complexity) were quantified using VAMPIRE in subgroups of individuals hypothesized to have varying levels of cSVD. This included a cohort of patients who have suffered cSVD-based haemorrhagic stroke5, a cohort of individuals with relatively healthy ageing in later life6 and a cohort of healthy individuals in mid-life thought to be at increased risk of Alzheimer's disease (based on family history)7.

RESULTS: Paired analysis over a 10-year age gap (72-82) revealed decreased retinal microvascular widths, densities and fractal dimensions with age ($p<0.001$), partially reflecting predicted cSVD-related cerebral changes with age. Multiple linear regression models revealed decreased retinal microvascular widths and densities in cSVD-based haemorrhagic stroke which reflects predicted

cerebral microvascular changes, after accounting for confounders and comparing to a relevant control. There was lack of evidence for retinal parameter differences in a mid-life cohort thought to be at risk of dementia later in life based of family history compared to controls.

CONCLUSIONS: Whilst not all retinal topographical parameters seem suitable as cSVD biomarkers, promising results have been identified in measures of retinal microvascular density. This pilot study suggests further investigations to confirm the repeatability of these findings is warranted, as retinal imaging biomarkers would offer a direct, affordable and noninvasive method of in-vivo cSVD assessment.

REFERENCES:

1 - Pantoni L (2010). 9(7), 689-701. PMID:20610345
2 - Laviña B, 2016; 18(1): 70. PMID:28042833
3 - Patton et al. 2005; 206(4): 319-348. PMID:15817102
4 - Perez-Rovira et al. 2011; 3391-3394. ISBN:978-1-4244-4122-8
5 – NHS Lothian 2013, 'Lothian Audit of the Treatment of Cerebral Haemorrhage (LATCH)'
6 – Deary et al. 2007; 7, 28. PMID: 18053258.
7 – Ritchie & Ritchie 2012; 2(6). doi: 10.1136/bmjopen-2012-001893.

Uptake of cervical screening in female patients at Eastbury Surgery, Northwood

Christopher Hillyar, Esther Lee, Amanda Shanmugaraja

Barts and The London School of Medicine and Dentistry, Queen Mary University of London

INTRODUCTION: The aim of this audit was to assess uptake of smear tests by patients at Eastbury Surgery. Objectives included 1) assessment of rates of smear events in female patients i) aged 25 to 49 years over a 3 year period and ii) aged 50 to 64 years over a 5 year period; and 2) estimation of smear uptake in female patients during i) 3-year recall and ii) 5-year recall.

PATIENTS AND METHODS: Percentage of patients smear tested was calculated by dividing the number of coded smear events by the total number of female patients. Three-year recall was defined from Sep 1 2016 to Aug 31 2019; and 5-year recall was from Sep 1 2014 to Aug 31 2019. Uptake of smear tests was estimated for patients aged 25 to 48 by combining year-on-year data during the 3-year recall period, while uptake of smear tests was estimated for patients aged 50 to 64 by combining year-on-year data during the 5- yearly recall period.

RESULTS: Of female patients aged 25 to 49, 8.8% per year (or a total of 26.4% over three years) underwent cervical smear testing over the three year of study period. For female patients aged 50 to 64 years, 8.1% per year (or a total of 40.7% over five years) underwent cervical smear testing over the five year period. When stratifying by age, the proportion of female patients undergoing smear tests was relatively heterogeneous, ranging from 8.6% to 25.0% of female patients per year in the 25 to 49 years of age group and 1.2% to 19.0% of female patients per year in the 50 to 64 years of age group. In total, the proportion of patients who underwent smear tests during 3-year and 5-year recall periods was estimated to be 32.5%- 51.7% and 40.6%-66.9%, respectively. A trend towards reduced uptake of smear tests with increasing patient age in both the 3-year recall and 5-year recall periods was observed.

CONCLUSIONS: Uptake of smear tests is suboptimal in women aged 25 to 49 years and 50 to 64 years. An intervention, such as an information leaflet or smartphone messaging, is needed to

increase uptake such that all female patients are screened in-line with the appropriate 3-yearly or 5-yearly interval.

Exploring the use of deep learning on multi-modal sensor data for monitoring human activity: an application in remote elderly care

Zain U. Hussain*, Dominic Ng*, Ragnor Comerford, Nathan Ng, Moiz A. Shah, Kia Dashtipour

University of Edinburgh

INTRODUCTION: The advancement of sensing technologies has made it possible to monitor human activities continuously. This has resulted in a range of healthcare applications including home behaviour analysis, gait analysis and gesture recognition. In the context of remote elderly care, wearable sensors can monitor body motion and physiological parameters, and have demonstrated potential in detecting abnormal/unforeseen circumstances. However, difficulties arise when attempting to integrate multi-modal sensor streams, which include a range of data types obtained from different sensors (accelerometers, barometers etc.). Deep learning algorithms have been explored for interpreting human activity and context from multi-sensor systems. In this study, the human activity monitoring problem was addressed as a classification problem, using wearable body sensor data.

PATIENTS AND METHODS: The MHEALTH (mobile HEALTH) dataset comprises body motion and vital signs recordings for ten volunteers of diverse profiles, while they perform twelve physical activities (common activities of daily living). Multiple body sensors were used to measure body motion (including acceleration, rate of turn and magnetic field orientation) and vital signs. We applied a range of conventional machine learning techniques to our classification problem, and compared their performance to some deep learning approaches. The dataset was divided into 60% for training, 30% for testing and 10% for validation.

RESULTS: Convolutional Neural Networks (CNN) and 2D-CNN, reported an accuracy of 82.24% and 79.74% respectively, and an F measure of 0.81 and 0.78 respectively. Conventional machine learning approaches reported the following: logistic regression (73.24% accuracy; 0.73 F-measure), Support Vector Machine (74.12% accuracy; 0.74 F-measure) and Naïve Bayes (69.28% accuracy; 0.69 F-measure).

CONCLUSIONS: To conclude, our deep learning approaches were found to significantly outperform conventional machine learning algorithms. This is the first study to apply deep learning approaches to the multi-modal MHEALTH dataset, demonstrating their potential for satisfactory activity recognition from multi-modal sensors. In future, these algorithms should be validated on a larger dataset with a wider range of activities, and then incorporated into real-world sensor prototypes for testing.

REFERENCES: Banos, O., Garcia, R., Holgado, J. A., Damas, M., Pomares, H., Rojas, I., Saez, A., Villalonga, C. mHealthDroid: a novel framework for agile development of mobile health applications. Proceedings of the 6th International Work-conference on Ambient Assisted Living an Active Ageing (IWAAL 2014), Belfast, Northern Ireland, December 2-5, (2014). Banos, O., Villalonga, C., Garcia, R., Saez, A., Damas, M., Holgado, J. A., Lee, S., Pomares, H., Rojas, I. Design, implementation and validation of a novel open framework for agile development of mobile health applications. BioMedical Engineering OnLine, vol. 14, no. S2:S6, pp. 1-20 (2015). Wang J, Chen Y, Hao S, Peng X, Hu L. Deep learning for sensor-based activity recognition: A survey. *Pattern Recognit Lett*. 2019;119:3-11. doi:10.1016/j.patrec.2018.02.010 Vepakomma P, De D, Das SK, Bhansali S. A-

Wristocracy: Deep learning on wrist-worn sensing for recognition of user complex activities. In: *2015 IEEE 12th International Conference on Wearable and Implantable Body Sensor Networks, BSN 2015*. Institute of Electrical and Electronics Engineers Inc.; 2015. doi:10.1109/BSN.2015.7299406

A case control study of the role of SPINK5 and filaggrin loss-of-function mutations in the occurrence and remission of food allergy

Abdiwahab Ibrahim, Michel Erlewyn-Lajeunesse, Nikki Graham, John Holloway

University of Southampton

INTRODUCTION: Defective skin barriers have been suggested to increase likelihood of food allergy as per the dual allergen hypothesis1. *Filaggrin* and *SPINK5* are genes involved in the maintenance and regulation of the skin barrier, and mutations in these genes have been identified to have an association with food allergies2 3. This study aims to explore the association of SPINK5 variant rs9325071 and FLG-LOF mutations with food allergy in the Isle of Wight cohort. It also aims to explore a potential difference in persistent and transient food allergies with relation to SPINK5 and FLG-LOF mutations.

PATIENTS AND METHODS: The Isle of Wight birth cohort (n=1536) gave DNA samples which were then genotyped for SPINK5 variant rs9325071 (A⟶G) using qPCR method. Phenotype data was collected from the cohort over an 18 year period. FA diagnosis was based on recognized allergic reactions within 4 hours after exposure to known food allergens. The cohort had already been genotyped for FLG-LOF and this data was available4. Association between SNPs and outcome was tested using chi-squared tests and logistic regression using SPSS.

RESULTS: The association between SPINK5 variant rs9325071 (A⟶G) and food allergy at 18 was statistically significant (p=0.034, OR=2.097, 95% CI 1.059-4.154). No association was found with food allergy at 10 years. We found that the presence of either skin barrier defect was also associated with food allergy at 18 (p=0.009, OR=2.390, 95% CI 1.245-4.592), and presence of both defects was not associated with food allergy at 18 (p=0.057, OR=4.511, 95% CI 0.957-21.263) due to a type II error (n=16).

CONCLUSIONS: We can report, for the first time, the association between SPINK5 variant rs9325071 (A⟶G) and food allergy past infancy. We have provided further evidence of the importance of the skin barrier in food allergy development. The skin barrier defects were associated at age 18 but not 10, suggesting that they are more closely associated with persistent food allergies. Joint analysis of FLG-LOF and SPINK5-LOF gave further evidence to support the link between skin barrier dysfunction and food allergy. However, it is not clear that this association occurs via sensitisation. Further analysis is required to clarify.

REFERENCES:

1. Du Toit G. et al. Prevention of food allergy. J Allergy Clin Immunol Volume 137, Issue 4, Pages 998–1010
2. Irvine AD, McLean WH. Breaking the (un)sound barrier: filaggrin is a major gene for atopic dermatitis. J Invest Dermatol 2006;126:1200-120
3. Ashley SE et al. The skin barrier function gene SPINK5 is associated with challengeproven IgE-mediated food allergy in infants. Allergy. 2017 Sep;72(9):1356-1364
4. Venkataraman D. et al. Filaggrin loss-of-function mutations are associated with food allergy in childhood and adolescence. J Allergy Clin Immunol. 2014;134(4):876-882.e4

Clinical and pathological features of Chronic Histiocytic Intervillositis

O. Ikotun, C. Brady, I. Crocker, C. Williams

University of Manchester Medical School

INTRODUCTION: Chronic histiocytic intervillositis (CHI) is a rare pathological disorder characterised by infiltration of monocytes into the intervillous space during pregnancy in the absence of infection. CHI is associated with adverse obstetric complications including IUGR, preterm birth and foetal loss throughout of gestation. CHI pathophysiology is poorly understood; however, an immune rejection mechanism of the placenta has been proposed.

AIMS: investigate (i) clinical characteristics of CHI (ii) placental histology of CHI pregnancies, (iii) evidence positive for immune rejection (iv) treatment outcomes in subsequent pregnancies

HYPOTHESIS: CHI is caused by a breakdown in maternal immune tolerance towards the foetus, similar to that underlying solid organ transplant rejection. Once defined, obstetric outcomes maybe improved with judicious use of immunosuppressive theories

PATIENTS AND METHODS: Retrospective study of clinical and obstetric history of CHI patients at St. Mary's Hospital, Manchester performed via statistical analysis. Immunohistochemistry used to demonstrate C4d complement deposition in CHI placentas. 29 participants (CHI n=21, control n=8)

RESULTS: Clinical CHI characteristics showed reduced livebirth rates (14%), gestational age, placental weight and decreased individualised birthweight centile (IBC). Microscopic pathological analysis demonstrated increased fibrin and C4d complement deposition in CHI-affected placentas. Treatment regimes in subsequent pregnancies resulted in increased livebirth rate (83%) and raised IBCs, with increased gestational age. Autoimmune and autoantibody disease was present in 33% of CHI cases.

CONCLUSIONS: CHI demonstrated poor obstetric and foetal outcome, theoretically due to syncytiotrophoblastic lesions caused by complement activation and fibrin deposition. This study proposes an antibody mediated rejection mechanism (ABMR) as an underlying process behind CHI.

REFERENCES:
1) Boyd TK, Redline RW. Chronic histiocytic intervillositis: a placental lesion associated with recurrent reproductive loss. Hum Pathol. 2000;31:1389–96
2) Reus AD, van Besouw NM, Molenaar NM, Steegers EA, Visser W, de Kuiper RP, et al. An immunological basis for chronic histiocytic intervillositis in recurrent fetal loss. Am J Reprod Immunol. 2013;70:230–7.
3) Traeder J, Jonigk D, Feist H, Bröcker V, Länger F, Kreipe H, et al. Pathological characteristics of a series of rare chronic histiocytic intervillositis of the placenta. Placenta. 2010;31:1116–9. 4) Vardi L, Paterson H, Hung NA. Successful pregnancy following treatment of recurrent chronic histiocytic intervillositis. BMJ Case Rep 2017

Are patients with depression receiving appropriate follow-up in general practice? An audit of adherence to National Institute for Health and Care Excellence (NICE) Guidelines

Shannon Ingram-Walpole, Supervisor: Dr Jim Lawrie

Barts and the London School of Medicine and Dentistry

INTRODUCTION: In recent years, the rising prevalence of depression has not been met by an ncrease in the availability of treatment1,2 and patients with depression are predominantly managed in primary care by their GP (General practitioner).3One of the most vital aspects of care given the lengthily waiting times is initial follow-up/review which often falls within the responsibility of the GP.3,4 This is reflected by the introduction of indicator DEP 003 in the QOF (Quality and Outcomes Framework) which requires "patients aged 18 or over with a new diagnosis of depression in the preceding 1st April to 31st March, who have been reviewed not earlier than 10 days after and not later than 56 days after the date of diagnosis".5(p.83) Initial analysis of the QOF 2017/18 report6 for NHS Newham CCG shows it is failing to meet the national targets for DEP 003, and rates have significantly decreased from 2016-2017, reasons for which remain unclear.

PATIENTS AND METHODS: An audit was carried out at a single GP practice in Newham CCG which was identified as failing to meet the DEP 003 QOF target of 80% to determine causes of low initial review rates of patients with depression. 96 patients at the practice were identified under the QOF DEP 003 indicator population report on EMIS as failing to have a review within the recommended time frame. The EMIS medical records of these patients were analysed by a single medical student using a data collection sheet to identify sources of failure to follow-up and potential areas for intervention to improve review rates and standard of care.

RESULTS: Of these 96 patients, 1 patient was exception excluded from the indicator population due to informed dissent, providing a final achievement rate of 95/159; 40.9%. Two broad causes were identified. The majority of cases (64.2%, n = 61) were due to coding inaccuracies which consisted of three main error types: 19.7% (n = 12) were due to no coding, 77.0% (n = 47) were due to incorrect coding predominantly of episode type (coding *first episode* instead of *review*) and 3.3% (n = 2) were caused by a mismatch in coding between appointments. These patients all in fact received a review within the timeline but due to coding inaccuracies were classed as failing to meet QOF targets. 34 patients (34.8%) were due to no follow-up appointment within the recommended time. Of these 10 patients (29.4%) received a review outside of the time frame, 1 patient did not attend their appointment, 5 patients (14.7%) were managed under secondary mental health services, and 14 patients (41.2%) did not make any appointment for review of which 3 were under 30 years of age recently prescribed SSRIs, 2 patients returned after the time period complaining of worsening symptoms and 6 had multiple appointments at the practice since for alternative presenting complaints with no review of depressive symptoms.

CONCLUSIONS: This audit sheds new light on two main causes of the low initial review rates by GPs for patients with depression: coding inaccuracies and failure to make a follow-up appointment in accordance with NICE guidelines. Two timely, cost-effective strategies that are easy to implement have been recommended and produced. Firstly, education; a PowerPoint presentation and a coding factsheet to be provided to GPs. Secondly, a patient leaflet to be provided at initial diagnosis which outlines the importance of follow-up appointments for review alongside details on how to self-refer for talking therapies, self-help resources, support groups and emergency helplines to provide additional support. It is hoped these interventions will improve review rates and overall care and prognosis of patients with depression in accordance with NICE guidelines. A second audit cycle is required to evaluate the efficacy of these interventions in general practice.

REFERENCES:

1. National Health Service. The NHS Long Term Plan. 2019; Available at: https://www.longtermplan.nhs.uk/wpcontent/uploads/2019/01/nhs-long-term-plan.pdf. Accessed April 1, 2019.
2. Rethink Mental Illness. Right treatment, Right time. 2018; Available at: https://rethink.org/media/3604410/right-treatment-right-placereport. pdf. Accessed April 4, 2019.

3. Care Quality Commission. Right here, Right now. 2015; Available at: https://www.cqc.org.uk/sites/default/files/20150630_righthere_mhcrisiscare_full.pdf. Accessed March 29, 2019.
4. National Institute for Health and Clinical Excellence. Depression in adults: recognition and management. Clinical guideline 90. London: NICE;2009. **5.** NHS England. 2016/17 General Medical Services (GMS) contract Quality and Outcomes Framework (QOF). 2016; Available at: ttps://tinyurl.com/y26mc6wl. Accessed April 2, 2019.
6. NHS Digital. QOF 2017-18: Prevalence, achievements and exceptions at CCG level. 2018; Available at: https://digital.nhs.uk/data-and-information/publications/statistical/quality-and-outcomes-frameworkachievement-prevalence-and-exceptions-data/2017-18. Accessed November 30, 2018.

Systematic Review of Clinicopathological Correlations in Logopenic Progressive Aphasia

Sheng Yuan Kan, Catherine Pennington

University of Edinburgh

INTRODUCTION: Logopenic progressive aphasia (lvPPA) is characterised by impaired word-retrieval and sentence repetition. It is usually associated with AD pathology, but other pathologies have been reported. [1] The objectives of this study was to estimate the prevalence of different neuropathology in autopsied lvPPA cases and evaluate the performance of new criteria in predicting Alzheimer's Disease (AD) pathology in lvPPA patients.

PATIENTS AND METHODS: In this systematic review, we developed search strategies to identify studies which reported clinical cases of lvPPA and neuropathology investigation results. The included studies were analysed for reporting quality, demographics, clinical criteria and pathological diagnosis.

RESULTS: Out of 2459 articles screened, 35 studies reported 200 lvPPA patients in total. Reporting quality were good for clinical criteria (100%) and neuropathology (91.4%), moderate for gender, age at onset and duration (60%) and poor for ethnicity (5.7%). The neuropathology findings in lvPPA are 74% AD, 20% Frontotemporal Lobar Degeneration (FTLD-TDP=14%, FTLD-Tau=6%), 2% Dementia with Lewy Bodies (DLB), 2% Creutzfeldt-Jakob disease (CJD) and 2% others. The positive predictive value of new criteria is 9% higher, but not statistically significant ($p>0.05$).

CONCLUSIONS: This study confirmed the prevalence of different neuropathologies among lvPPA patients, with AD pathology being the most prevalent. We also showed that more studies are published using the new criteria and suggested the importance of multimodal diagnostic approach due to the low positive predictive value (77%) of the consensus clinical criteria.

REFERENCES: 1. Marshall CR, Hardy CJ, Volkmer A, Russell LL, Bond RL, Fletcher PD, Clark CN, Mummery CJ, Schott JM, Rossor MN, Fox NC. Primary progressive aphasia: a clinical approach. Journal of neurology. 2018 Jun 1;265(6):1474-90.

Demystifying the rising demand for a regional plastic trauma clinic, a retrospective cross-sectional study

Chie Katsura, Mr James Haeney

Hull York Medical School

INTRODUCTION: Hull Royal Infirmary Plastic Trauma Clinic was established in 2013 to support the major trauma centre. It was designed to provide same day assessment and treatment for 8-12 patients daily. However, the clinic has experienced a significant rise in both referral numbers and sources. This study reviews the trends and patterns of referrals over the years to improve care and services.

PATIENTS AND METHODS: A retrospective cross-sectional study of Plastic Trauma Clinic referrals of the first complete week of March, June, September, and December between March 2014 and June 2018. 1324 patients medical notes were reviewed. Data for patient demographics, referrals, types of injury and outcomes were analysed.

RESULTS: The daily average number of patients has increased 2.3 times from <10 in 2013 to 27 in June 2018, with sharp rises between 2015-2016 and in 2018. Local community providers (CHCP) and Emergency Departments (ED) make up 90% of the referrals. Weekly ED referrals have increased by 53% between March 2016 and June 2018, in which referrals from EDs outside Hull have doubled. CHCP referrals have tripled during the same time period. On average, 80% of patients were treated on the same day. Only 50% required a follow up. The incidence of open wounds in adults has increased by 1.5 times in June 2018. Moreover, a significant increase in closed fractures is seen among paediatric patients

CONCLUSIONS: In response to rising demand for Plastic Trauma Clinic access, the clinic has been restructured and expanded. This has increased the proportion of patients receiving same day treatment. The rise in referrals from community providers appears to correlate with the advent of delivery of minor injury unit services by the community health care partnerships (CHCP) providers.

Severe & Enduring Mental Illness And HIV: An Under-Recognised Syndemic?

1st Author: Anna Kennedy. 2nd Authors: Hinsum Wong, Robyn Canham

Edinburgh Medical School, Year 6.

INTRODUCTION: Numerous studies have shown wide-spread psychiatric co-morbidity in HIV+ cohorts1. However, current research has largely focused on co-existence of HIV and depression1; little is known about coexistence of psychotic disorders, bipolar disorder and personality disorder (collectively termed 'Severe and Enduring' – S&E - psychiatric disorders) and HIV. Sparse data which does exist suggests a reciprocal relationship; HIV+ persons have been found to be at increased risk of developing S&E psychiatric illness2, and patients with S&E psychiatric illness to be at increased risk of HIV3. Urgent need to characterise this relationship is emphasised by suggestions of worse medication compliance and HIV outcomes4 in patients with any psychiatric co-morbidity. If demonstrated in people with *S&E psychiatric illness* this would have implications not only for co-morbid individuals, but for wider society; given S&E symptoms (e.g. disinhibition, hyper-sexuality) inherently make high-risk HIV behaviour likely, this could represent a source of viral transmission. To our knowledge there is no UK data on S&E+HIV+ co-morbidity. Accordingly, aims of this project were

to evaluate prevalence of comorbidity, evaluate temporal relationship between respective diagnoses and explore HIV outcomes of those with S&E psychiatric illness in an Edinburgh HIV+ cohort.

PATIENTS AND METHODS: HIV+ patients treated at RIDU, Western General Hospital June 2017 – March 2019 with co-existing S&E psychiatric illness were identified from existing departmental databases. After reviewing the literature, a relevant pro-forma for data collection was created. All volumes of psychiatric notes for patients identified with co-existing HIV and S&E psychiatric illness were recalled to obtain psychiatric information. Paper medical notes and electronic TRAK records were used to obtain HIV information.

RESULTS: 53 of 885 HIV+ patients (6.0%) had severe and enduring psychiatric diagnosis – 6.7x reported background prevalence 5. 75.4% of patients were diagnosed with HIV before S&E psychiatric illness and 24.6% with S&E psychiatric illness before HIV. Of patients in whom CD4+ count at HIV diagnosis was available, 39% had CD4+ of <200, classified as 'very late stage' and indicative of advanced HIV. 31.3% of the 'very late stage diagnoses' were under regular psychiatric review prior to HIV diagnosis, and had been psychiatric inpatients on at least one occasion in the preceding decade, implying opportunities for HIV diagnosis were missed. All patients had been prescribed anti-retrovirals for >3 years, sufficient time to expect an undetectable HIV viral load (VL) and recovered CD4+ count. Across the cohort, 92% had undetectable VL, lower than reported background suppression rate of 97%6. 60.4% of patients had a CD4+ count ≥ 500 (normal), 30.2% had a CD4+of 200-499 (impaired immunity) and an alarming 9.4% had CD4+ of <200, indicative of severe immunosuppression.

CONCLUSIONS: This study provides the first UK data demonstrating increased prevalence of severe and enduring psychiatric co-morbidities in HIV+ persons. Furthermore, it suggests that lack of awareness about the prevalence of co-morbidity is likely contributing to delayed HIV diagnosis. Observed proportion of detectable viral loads and CD4+ count <200 implies HIV outcomes are poor in those with co-existing S&E psychiatric illness. Collectively, findings highlight urgent need for further research into S&E psychiatric co-morbidity in HIV+ populations.

REFERENCES:

1. Galvan FH, Burnam MA, Bing EG. Co- occurring psychiatric symptoms and drug dependence or heavy drinking among HIV- positive people. *J Psychoactive Drugs.* 2003;35:153–60.
2. Jallow A, Ljunggren G, Wändell P, Wahlström L, Carlsson AC. HIV-infection and psychiatric illnesses – A double edged sword that threatens the vision of a contained epidemic: The Greater Stockholm HIV Cohort Study. *J Infect.* 2017;74(1):22– 8.
3. Beyer JL, Taylor L, Gersing KR, Krishnan KRR. Prevalence of HIV Infection in a General Psychiatric Outpatient Population. *Psychosomatics*. 2007;48(1):31–7.
4. Hartzell JD, Janke IE, Weintrob AC. Impact of depression on HIV outcomes in the HAART era. *J Antimicrob Chemother.* 2008;62(2):246–55.
5. Lachowycz K, Celebi S, Price G, Lugton C, Roche R.
Severe Mental Illness (SMI) and Physical Health Inequalities: Briefing. Public Helath England, Report number: 2018395. 2018. **6**. National AIDs Trust. *HIV in the UK Statistics - 2017.* Available from: https://www.nat.org.uk/we-inform/HIV-statistics/UK-statistics [accessed 14/10/19]

Undergraduate Teaching in Psychological Aspects of Medicine across the early years of medical school: a literature review, survey, and action plan.

Surabhi Kumar, Dr Neelom Sharma

University of Edinburgh

INTRODUCTION: The care of mental health patients is constantly improving with medical advances leading to a greater quality of treatments and services. There still exists, however, a huge discrepancy between attitudes to mental and physical health within the medical community. Previous research shows medical students go through their studies becoming increasingly stigmatised towards those with medical illness, and these negative attitudes lead to fewer students considering psychiatry as a career. This study aimed to quantify the stigma levels of Edinburgh University medical students, and investigate how this varied with various demographic aspects.

PATIENTS AND METHODS: The Opening Minds Stigma Scale for Health Care Providers (OMS-HC) was modified and used to quantify stigma. This was distributed as an online survey through the Edinburgh Undergraduate Medicine online portal and through social media groups. Demographic data such as gender, stage of study, considerations of psychiatry was collected, as well as their thoughts on the teaching received so far. A total of n=139 responses were received.

RESULTS: One-way ANOVA tests showed that there was no significant change between stigma levels between those at the start of the course and those at the end ($F(2,136)=3.946$, $p=0.680$). 21.6% (n=30) of participants reported experiencing mental health problems themselves, and this group was shown to be significantly less stigmatising towards mental illness ($F(1,137)=18.566$, $p<0.001$). Students who were considering a career in psychiatry also showed significantly less stigma ($F(2,136)=3.946$, $p=0.022$). 73.4% (n=102) of participants reported dissatisfaction with the teaching they had received into mental health and illness, and many of these students provided suggestions of improvements they would like to see, such as more teaching in preclinical years.

CONCLUSIONS: These results indicate that there is no change in mental illness stigma as Edinburgh medical students progress through their course. This lack of improvement, and the fact that students with personal experiences of mental illness or an interest in psychiatry show better attitudes, is indicative of a gap in current teaching. Along with these, the course dissatisfaction and students' suggestions provide a useful baseline for improvement, and this survey introduces a useful way of quantifying change in the coming years.

REFERENCES:

- Rüsch N, Angermeyer MC, Corrigan PW. *Mental illness stigma: Concepts, consequences, and initiatives to reduce stigma.* Eur Psychiatry. 2005;20(8):529–39.
- Curtis-Barton MT, Eagles JM. *Factors that discourage medical students from pursuing a career in psychiatry.* Psychiatrist. 2011;35(11):425-9
- Totic S, Stojiljković D, Pavlovic Z, Zaric N, Zarkovic B, Malic L, et al. *Stigmatization of "psychiatric label" by medical and non-medical students.* Int J Soc Psychiatry. 2012;58(5):455–62.
- Modgill G, Patten SB, Knaak S, Kassam A, Szeto AC. *Opening Minds Stigma Scale for Health Care Providers (OMS-HC): Examination of psychometric properties and responsiveness.* BMC Psychiatry. 2014 Dec 23;14(1):120.

Development and analysis of the efficacy of audio-visual educational resources on hydroxychloroquine for patients with rheumatic conditions

Mr Ha Bao Trung Le, Dr Mohini Gray

University of Edinburgh Medical School

INTRODUCTION: Hydroxychloroquine is commonly used for the treatment of various rheumatic diseases. Patients are normally counselled and commenced on this following a brief clinic visit and given a leaflet to take home. The advent of the internet provides an effective means of offering additional resources to enable patients to make a more informed choice about taking a medication with potentially serious side-effects. We decided to utilise this to our advantage by producing a video educating patients on safely taking this medication.

PATIENTS AND METHODS: A questionnaire (n=31) was distributed to patients awaiting their clinic appointment at the Western General Hospital to help decide the subject of the video and evaluate the resources currently being given to patients. A video on hydroxychloroquine was then produced with the kind help of Dr Mohini Gray and an anonymous feedback survey (n=43), of which 60% (26/43) were patients from the Rheumatology department, was given out to participants after seeing the video who also provided insightful comments and suggested further improvements. The surveys were then processed using the R console statistical software using Fisher's exact test for count data and p-values were generated for the various questions in the survey.

RESULTS: All of the patients who participated in the survey agreed that the video provided them with sufficient information regarding the medication. This is in contrast to the 60% who felt leaflets were sufficient before seeing the video. The comparison between the two mediums of information shows that the video to be significantly better at delivering information for patients ($p<0.001$). The feedback on the survey also suggested some improvements which were then taken into account when producing the final draft of the video.

CONCLUSIONS: The results from this study have been very positive in favour of additional video resources for patients rather than just giving leaflets alone. Patients were more satisfied with the provision of an accessible video and we hope that this will empower them to make better informed decisions regarding their medication. IWe are also hoping this study will serve as a catalyst to developing more audio-visual resources for patients and help them engage more with their healthcare.

Management of ectopic pregnancy in a patient with a previous salpingectomy wishing to preserve fertility

Hui Wei Leow, Emem Usoro

University of Edinburgh

INTRODUCTION: Ectopic pregnancy is a potentially life-threatening condition and remains the leading cause of maternal death during early pregnancy. It occurs in approximately 1.5-2% of pregnancies. Given the increasing prevalence of ectopic pregnancy, this case highlights the importance of discussing future fertility implications with the haemodynamically stable ectopic pregnancy patient.

PATIENTS AND METHODS: This is a case study. All patient medical notes were obtained from TrakCare, an electronic patient management system used across NHS Lothian, with patient's consent. We have ensured that all the information included was anonymised.

RESULTS: A 30-year-old female presented with vaginal bleeding and left iliac fossa (LIF) pain. Her last menstrual period (LMP) was 4 weeks prior. She had a previous right salpingectomy and had been trying to conceive with her partner for 9 years. Transvaginal ultrasound scan (TVS) confirmed a left tubal ectopic pregnancy which was initially treated with methotrexate injection with the aim of preserving her left tube. However, she had increasing LIF pain, shoulder-tip pain, nausea and vomiting after 9 days. Her pelvic ultrasound was suspicious of a ruptured ectopic pregnancy in her left fallopian tube. She initially declined surgery due to fertility concerns, but due to increasing pain, she underwent surgery. At laparoscopy, the surgeon found a swollen left fallopian tube and bleeding from the ruptured ectopic pregnancy with an estimate of 100ml of blood in the POD. Both ovaries looked normal. Left salpingectomy was performed and the surgery was without complications. The patient recovered well and was discharged home the next day. The patient was advised to take a urinary pregnancy test in 2 weeks and to contact the gynaecology ward if this is positive. She would require IVF treatment for any wanted pregnancies in the future and she was aware of this. She was advised to contact her GP or the consultant should she wish to pursue IVF in the future.

CONCLUSIONS: It is important to consider patient's wish to preserve fertility when deciding treatment for ectopic pregnancy - The risk factors of repeat ectopic pregnancy are associated with the numbers of previous ectopic pregnancy, history of infertility, obesity and IVF - Weight loss in obese patients can improve IVF outcome - Patients undergoing fertility treatment may benefit from mental health services to help them manage stress - Subsequent IVF outcome of those with ectopic pregnancy is encouraging

Cultivating interest in women's health through a medical student O&G society

Hikari Sakurai, Hui Wei Leow

University of Edinburgh

INTRODUCTION: The aim of Edinburgh University Obstetrics and Gynaecology Society (EUOGS) is to provide valuable opportunities for students to gain an insight into women's health. Through conferences and tutorials, students are exposed to a variety of learning and networking opportunities to further their interest in this field, which can complement their medical education in university.

PATIENTS AND METHODS: The conference and tutorials were organised by our committee members, with the support from clinicians in NHS Lothian. The conference included talks by senior clinicians, debates on topical issues, and practical workshops. The tutorials included OSCE style tutorial, suturing and knot tying sessions, resilience advice, and exam preparation. Feedback questionnaires were circulated after the sessions to evaluate student response. This is a qualitative and quantitative analysis of student feedback from our annual conference and tutorials.

RESULTS: We received a response rate of 72.% for our conference feedback. 100% of students learnt something new from the conference that will inform future work. The key words identified for the feedback was: interesting speakers, enjoyable workshops, friendly tutors, very well organised, hands-on experience. For the Year 5 Mock OSCE tutorial, 100% of students who returned their feedback forms agreed that they had increased level of confidence after the tutorial and would

recommend this tutorial to their peers. They found it useful to be exposed to challenging scenarios, to familiarise themselves with the OSCE format, and to receive constructive feedback from tutors. CONCLUSIONS: Learning experiences provided by EUOGS provide valuable opportunities for students to immerse themselves in discussions and practical sessions, which help them to gain an insight into a career in obstetrics and gynaecology. EUOGS motivate students to pursue their interest in women's health.

Cervical ectopic pregnancy following fresh IVF cycle

Hui Wei Leow, Rashda Bano

University of Edinburgh

INTRODUCTION: Ectopic pregnancy is potentially a life-threatening complication during early pregnancy which can lead to haemorrhage. Women who undergo in vitro fertilization (IVF) have up to 2.5 fold increased risk of ectopic pregnancy. This is a rare case of cervical ectopic pregnancy. This case highlights the importance of having a high index of suspicion for ectopic pregnancy.

PATIENTS AND METHODS: This is a case study. All patient medical notes were obtained from TrakCare, an electronic patient management system used across NHS Lothian, with patient's consent. We have ensured that all the information included was anonymised.

RESULTS: A 35-year-old nulliparous lady underwent IVF due to unexplained subfertility. Her serum hCG level was 752 IU/L 16 days post-embryo transfer. She presented with vaginal bleeding at 6 weeks of gestation. Transvaginal ultrasound (TVS) showed a small sac in uterus suggestive of a blood clot. Her bleeding eased off after a week. TVS at 7 weeks of gestation revealed an empty uterus with no free fluid or adnexal mass. However, a second TVS was performed which revealed a cervical ectopic pregnancy and her serum hCG level was 7839 IU/L then. The cervical ectopic pregnancy was surgically removed the next day under ultrasound guidance. The patient had an uneventful recovery and her fertility was preserved. Her serum hCG decreased progressively and was <1 IU/L one month post-surgery. The management plan for the patient was frozen embryo transfer and a TVS at 6 weeks of gestation to locate future pregnancy. The patient conceived naturally two months post-surgery, and delivered a healthy baby at term.

CONCLUSIONS: This report highlights the importance of having a high index of suspicion of ectopic pregnancy in women presenting with vaginal bleeding who have undergone IVF treatment because earlier diagnosis can help prevent rupture of ectopic pregnancy or catastrophic outcome.

Diagnostic and prognostic value of serum C-reactive protein in heart failure with preserved ejection fraction: a systematic review and meta-analysis

Ishan Lakhani [1], Keith Sai Kit Leung [2], Ka Hou Christien Li [3]

1) Faculty of Medicine, The Chinese University of Hong Kong; 2) Aston Medical School, Aston University; 3) Wirral University Teaching Hospital NHS Foundation Trust

INTRODUCTION: Heart failure (HF) is a major epidemic with rising morbidity and mortality rates that encumber global healthcare systems. Whilst some studies have demonstrated the value of CRP in predicting i) the development of HFpEF and ii) long-term clinical outcomes in HFpEF patients, others have shown no such correlation. As a result, we conducted the following systematic review and meta-analysis to assess both the diagnostic and prognostic role of CRP in HFpEF.

PATIENTS AND METHODS: PubMed and Embase were searched for studies that assess the relationship between CRP and HFpEF using the following search terms: (((C-reactive protein) AND ((preserved ejection fraction) OR (diastolic heart failure))). The search period was from the start of database to 6th August 2019, with no language restrictions.

RESULTS: A total of 312 and 233 studies were obtained from PubMed and Embase respectively, from which 19 studies were included. Our meta-analysis demonstrated the value of a high CRP in predicting the development of not only new onset HFpEF (HR: 1.08; 95% CI: 1.00-1.16; P = 0.04; I2 = 22%), but also an increased risk of cardiovascular mortality when used as a categorical (HR: 2.52; 95% CI: 1.61-3.96; P <0.0001; I2 = 19%) or a continuous variable (HR: 1.24; 95% CI: 1.04-1.47; P = 0.01; I2 = 28%), as well as all-cause mortality when used as a categorical (HR: 1.78; 95% CI: 1.53-2.06; P < 0.00001; I2 = 0%) or a continuous variable: (HR: 1.06; 95% CI: 1.02-1.06; P = 0.003; I2 = 61%)] in HFpEF patients.

CONCLUSIONS: CRP can be used as a biomarker to predict the development of HFpEF and long-term clinical outcomes in HFpEF patients. This biomarker could potentially be useful for risk stratification and guiding clinical management in this patient population.

REFERENCES:
[1] Brouwers FP et al. Clinical risk stratification optimizes value of biomarkers to predict new-onset heart failure in a community-based cohort. Circ Heart Fail. 2014;7:723-31.
[2] de Boer RA et al. Association of Cardiovascular Biomarkers With Incident Heart Failure With Preserved and Reduced Ejection Fraction. JAMA Cardiol. 2018;3:215-24.
[3] Kalogeropoulos A et al. Inflammatory markers and incident heart failure risk in older adults: the Health ABC (Health, Aging, and Body Composition) study. J Am Coll Cardiol. 2010;55:2129-37.
[4] Silverman MG et al. Impact of Race, Ethnicity, and Multimodality Biomarkers on the Incidence of New-Onset Heart Failure With Preserved Ejection Fraction.
[5] Tromp J, Khan MA, Klip IT, Meyer S, de Boer RA, Jaarsma T, et al. Biomarker Profiles in Heart Failure Patients With Preserved and Reduced Ejection Fraction. J Am Heart Assoc. 2017;6.

EVD Insertion Audit. Organisms and factors affecting catheter associated ventriculitis.

Ms McKenna, Dr Rosmarin, S. Yordanov SHO, A. Lopuszko

Barts and The London School of Medicine and Dentistry

INTRODUCTION: Extra Ventricular Drainage (EVD) is a neurosurgical technique most commonly used to lower the intercranial pressure and relieve hydrocephalus while cerebrospinal fluid (CSF) flow is obstructed. CSF surrounds the brain, filling four ventricles and protects the brain from injury. EVD is a narrow tube (catheter), temporarily inserted into the lateral ventricles and connected to an external system of drainage. The infection rate associated with the insertion of EVD in the UK and Ireland is 9.3%.(1) The most common disease that developed in patients was ventriculitis, which led to more patients requiring a transfer to Intensive Treatment Unit. The aim of the research was to compare major trauma centre's and national results to implement a more effective treatment with better patient outcomes.

PATIENTS AND METHODS: The data was collected from 43 patients who have all been admitted to the hospital (98% as emergency cases). The median age was 51 with majority of patients being female (53%). The GCS's median on admission was 13. For all EVD procedures, silver coated catheters were used. The surgical factors such as the surgical team performance and the average

operative time (1h 11min) were accounted for in the audit. A right-sided insertion was performed in 84% of cases, whilst only 14% of cases were left-handed insertions, and the remaining 2% were bilateral insertions. All patients had their hair clipped. The most common reason for EVD insertion was subarachnoid haemorrhage (21 out of 43 patients, 49%). Prophylactic antibiotics were administered in all cases before the surgery, whereas there was only one case of post-operative prophylactic antibiotic administration. 12% of the EVDs were used for Intercranial Pressure Monitoring. CSF sampling was conducted in 65% of cases. The average number of samples taken was 11 with one patient being sampled 37 times.

RESULTS: 12% patients' samples were found to have catheter associated infections. The most common organisms isolated in the samples were Klebsiella, Coagulase-negative Staphylococci, and Pseudomonas. The average EVD insertion period was 18 days. EVD leaks occurred in 11 cases (26%). 7 out of these required resuturing. Out of those, 3 patients have subsequently developed ventriculitis. White cell count result was over 10,000 cells per mm3 in 40% of patients.

CONCLUSIONS: The average sampling time in this Major Trauma Centre was 18 days, which is over twice more than the national average of 8 days. This increases the number of patients transferred to an ITU which makes the admission longer and more expensive. It is argued that the cause would be the use of out-of-date EVD type and this could be replaced by the new system bolt-EVD. This would also decrease the number of leaks and associated resuturing on the wards. However the silver impregnated lines versus non-impregnated have a lower cerebrospinal fluid infection,(2) the bolt-connected EVDs would be more precise and would decrease the rate of resuturing and hence decrease a chance of CSF infection.(3) Additionally, it is suggested that ITU nurses' training should be improved as majority of patients are being treated in ITU. The Senior House Assistants training should also be improved to ensure strict aseptic technique.

REFERENCES:

(1) Jamjoom AAB, Joannides AJ, Poon MT on behalf of the British Neurosurgical Trainee Research Collaborative, *et al* Prospective, multicentre study of external ventricular drainage-related infections in the UK and Ireland. *Journal of Neurology, Neurosurgery & Psychiatry* 2018;89:120-126.
(2) Keong NC, e. (2012*). The SILVER (Silver Impregnated Line Versus EVD Randomized trial): a doubleblind, prospective, randomized, controlled trial of an intervention to r... - PubMed - NCBI.* [online] Ncbi.nlm.nih.gov. Available at: https://www.ncbi.nlm.nih.gov/pubmed/22811084 [Accessed 17 Oct.2019].
(3) Bergdal O, e. (2013). *Accuracy of tunnelated vs. bolt-connected external ventricular drains. - PubMed - NCBI.* [online] Ncbi.nlm.nih.gov. Available at: https://www.ncbi.nlm.nih.gov/pubmed/23790470 [Accessed 17 Oct. 2019].

The impact of routine post-discharge jejunostomy feeding on the nutritional status of oesophagectomy patients

Katherine A Lowe, Anna Paisley, Simon Paterson-Brown, Graeme W Couper, Christopher Deans, Peter J Lamb, Richard JE Skipworth

University of Edinburgh

INTRODUCTION: The nutritional status of oesophagectomy patients is often compromised, and therefore nutritional support is paramount in the overall management of these patients. Currently, there are no evidenced-based guidelines specific to their optimum nutritional management. It is our routine clinical practice to place a surgical jejunostomy at the time of oesophagectomy to facilitate early enteral nutritional support. Following training, patients are then discharged with nocturnal

jejunostomy feeding to be regularly followed up by community dieticians. Feeding is discontinued when community dietetics are satisfied with patient oral intake. We aimed to assess the impact of routine jejunostomy feeding on post-operative nutritional status.

PATIENTS AND METHODS: Inclusion criteria were: diagnosis of oesophageal malignancy within NHS Lothian treated by Ivor-Lewis oesophagectomy between April 2013 and February 2016; surgical jejunostomy placement at the time of primary surgery; and availability of peri-operative nutritional data. Fifty consecutive patient records were identified from the prospective local audit database. The primary outcome was change in weight from pre-operative baseline to 12 months post-operatively. Secondary outcomes included additional markers of nutritional status (admission MUST score and serum albumin), and incidence of jejunostomy-related complications.

RESULTS: Ninety percent (90%) of patients demonstrated ongoing weight loss from baseline to 12 months, post-operatively. Median weight loss at 2, 6 and 12 months was -6.0%, -8.5% and -13.0%, respectively. Median length of time of jejunostomy feeding was 9.4 weeks (range 1.3-54.7). At the time of jejunostomy removal, median percentage change in weight was - 5.9% (range -20.5 to +9.4). Weight change did not correlate with duration of postoperative nutrition. Regarding jejunostomy-related complications, a total of 10 minor complications occurred in 8 patients (16%), and there was 1 major complication (2%: surgery required to remove the tube).

CONCLUSIONS: In oesophagectomy patients, post-discharge jejunostomy feeding can be delivered routinely in a safe fashion. However, despite extended enteral nutritional support, patients remain at risk of marked weight loss. Jejunostomy removal is often approved when patients continue to display ongoing weight loss, suggesting that the criteria for timely jejunostomy removal may require reassessment. Efficacy of jejunostomy feeding in combination with other supportive measures warrants further investigation.

Investigating the role of FoxA1 in Epithelial-to-Mesenchymal Transition: implications for FoxA1 as a therapeutic target in oestrogen receptor positive breast cancer

Jocelyn Luveta, Matilda Brock, Cintia Monteiro, Hilary Collins, David Heery, Simon Johnston

University of Nottingham

INTRODUCTION: Oestrogen receptor alpha (ERα) is the driving transcription factor in 75% of breast cancer, fuelled by circulating oestrogen (E2). ERα-mediated transcriptional programmes sustain proliferation signalling in ER+ (luminal) breast cancer. FoxA1 is a pioneer factor and is critical for ERα signalling. FoxA1 opens up condensed chromatin at specific ERα binding sites. Targeting the pioneer factor FoxA1 is a promising therapeutic strategy under development for endocrine-resistant breast cancer1. FoxA1 is a good prognostic factor in primary breast cancer. Along with ERα, FoxA1 defines the “luminal” breast cancer subtype associated with favourable clinical outcome. Recent evidence that FoxA1 represses the aggressive, “basal” phenotype casts doubt on targeting FoxA1 as a therapeutic strategy2.

HYPOTHESIS: Epithelial-to-Mesenchymal Transition (EMT) is a potential mechanism of resistance to FoxA1-targeted therapy in breast cancer.

PATIENTS AND METHODS: FoxA1 inhibition was modelled by reverse transfecting short-interfering RNA targeting FoxA1 (siFoxA1) on ER+ MCF7 breast cancer cells. Non-targeting RNA (siNT) was a negative control for transfection, and an EMT-inducing cell media supplement (EMT+) was used a

positive control for induction of EMT morphology. Cells were harvested at 48 hours. Quantitative PCR array was used to measure expression of a panel of 81 EMT-associated and control genes on a 96-well plate, in biological duplicate. In parallel, microscopy was performed at 72 hours of transfection to compare morphology under the 3 different experimental conditions (siNT, siFoxA1, EMT+).

RESULTS: (1) Reverse transfection achieved >95% efficiency (knockdown of FoxA1 expression). (2) Most EMT-associated genes in the panel were upregulated after 48 hours transfection with siFoxA1 (*versus* negative control, siNT). (3) Knockdown of FoxA1 expression did not induce morphological features of EMT at 72 hours (*versus* positive control, EMT+). *Next step:* Perform in multiple ER+ cell lines in triplicate for statistical analysis by ANOVA

CONCLUSIONS: Early results indicate that FoxA1 knockdown leads to upregulation of EMT-associated genes in ER+ MCF7 breast cancer cells. However, EMT morphology was not induced by FoxA1 knockdown. This suggests that targeting FoxA1 may induce EMT-associated genes but not an EMT phenotype. Confirmatory migration and invasion assays are underway.

REFERENCES:

1. Transcription factors and chromatin proteins as therapeutic targets in cancer. Johnston SJ & Carroll JS. Biochimica et Biophysicia Acta 2015.
2. FoxA1 represses the molecular phenotype of basal breast cancer cells. Bernado GM *et al*. Oncogene 2013.

A retrospective study of the long-term outcomes of patients in Scotland with Diplegic Cerebral Palsy who have had Selective Dorsal Rhizotomy.

Craig MacPhee, Mr Donald Campbell

University of Dundee

INTRODUCTION: The primary aim of this research is to determine if the outcome of *Selective Dorsal Rhizotomy* (SDR) in a group of Diplegic Cerebral Palsy patients based in Scotland have a long-term positive impact on the patient's mobilisation. SDR is a neurosurgical procedure that aims to reduce spasticity and improve mobility in patients with CP and lower extremity spasticity. This study specifically looks at the *Gross Motor Functional Classification System* (GMFCS) and *Functional Mobility Scale* (FMS) scores of the patient prior to SDR, and up to 8 years post-op.

PATIENTS AND METHODS: This was a retrospective study of 42 patients based in Scotland who have undergone SDR. The data was collected via two main databases, the NHS Clinical Portal system and the *Cerebral Palsy Integrated Pathway Scotland* (CPIPS) online database.

RESULTS: Pre-operative GMFCS scores were I (6%), II (27%), III (54%), and IV (12%). Median age was 7 years and 60% were female patients. 23% of these patients experienced an increase in GMFCS, 65% maintained their score and 12% experienced a decrease. For FMS average improvement on long term follow up was 38%, maintained score was 39%, and a decline in score was 14%. Of the 10 patients who had the procedure carried out by private means (i.e. in the USA); there was a GMFCS decline in 20% of cases with no reported improvements.

CONCLUSIONS: This study supports the growing evidence in support of SDR as a good long-term treatment for some patients with Diplegic Cerebral Palsy. It shows that patients with lower GMFCS scores who sought private intervention had a poorer outcome than patients that went through the more stringent selection in the NHS.

REFERENCES:

1) Aquilina K, Graham D, Wimalasundera N. Selective dorsal rhizotomy: an old treatment re-emerging. Archives of Disease in Childhood. 2015;100(8):798-802.
2) Park T, Dobbs M, Cho J. Evidence Supporting Selective Dorsal Rhizotomy for Treatment of Spastic Cerebral Palsy. Cureus. 2018
3) Munger M, Aldahondo N, Krach L, Novacheck T, Schwartz M. Long-term outcomes after selective dorsal rhizotomy: a retrospective matched cohort study. Developmental Medicine & Child Neurology. 2017;59(11):1196-1203.
4) Summers J, Coker B, Eddy S, Elstad M, Bunce C, Bourmpaki E et al. Selective dorsal rhizotomy in ambulant children with cerebral palsy: an observational cohort study. The Lancet Child & Adolescent Health. 2019;3(7):455-462.

Do Cannabinoids Exert Anti-tumour Effects in Ovarian Cancer Cells?

Christopher Marshall, Gillian Smith, Hugh Nicholson

University of Dundee

INTRODUCTION: Cannabis compounds- cannabidiol (CBD), cannabinol (CBN) and Δ9-tetrohydrocannabinol (THC) have been shown to exert symptomatic relief but also anti-tumour effects in multiple human cancers (e.g. breast cancer and glioma) using both *in vitro* and *in vivo* models1,2,3. The primary mechanism of action is through activation of the cannabinoid 1 and 2 receptors, CB1R and CB2R4. The purpose of this study was to investigate whether cannabis and cannabinoid receptor agonists/antagonists may cause similar anti-tumour effects in ovarian cancer cell lines, using A2780, A1847, and their paclitaxel-resistant derivatives cell lines A2780pacR and A1847pacR, in addition to glioma cell lines T98G and U87-MG. Cannabinoids have been shown to interact with multidrug resistance protein 1/ P-glycoprotein (MDR1/P-gp), known to be a common mechanism of resistance5. Therefore, A2780pacR and A1847pacR cells, containing P-gp, were used to assess for cannabinoid interaction.

PATIENTS AND METHODS: MTT assays were performed using cannabinoids, CB1 agonist methanandamide), CB1 antagonist (AM251) (0-12μM) and paclitaxel (0-32μM) to assess for cell toxicity of ovarian and glioma cancer cell lines (mentioned above). Quantitative real time-polymerase chain reaction (qRT-PCR) analysed *CNR1* and *CNR2* mRNA expression in ovarian cancer and glioma cell lines, and in A2780 cells exposed to cannabinoids for over 4 weeks. *CNR1* and *CNR2* mRNA expressions where also obtained for … women from cBioPortal.

RESULTS: Cannabinoids exerted no toxicity effects in ovarian cancer or glioma cells, but low concentrations (<1μM) potentiated proliferation. The lack of toxicity in A2780pacR and A1847pacR cells demonstrated no interaction with P-gp. *CNR1* and *CNR2* mRNA expression was elevated in T98G, U87-MG, A2780pacR and A1847pacR cells compared to A2780 and A1847 cells. A2780pacR cells were re-sensitised to paclitaxel using AM251, a CB1 antagonist. Chronic exposure to cannabinoids significantly increased cannabinoid receptor expression, which may therefore be a novel therapeutic target in ovarian cancer patients. Data obtained from cBioPortal demonstrated that cannabinoid receptor expression is variable among ovarian cancer samples.

CONCLUSIONS: Although cannabis can be used for symptomatic relief, it potentiates ovarian cancer growth at low concentrations and shows no anti-tumoural effects. More research is required before giving any formal recommendation on cannabis use but cannabinoid receptor antagonists, like AM251, may have a role for increasing chemosensitivity in paclitaxel resistant ovarian cancers which express cannabinoid receptors.

REFERENCES:

1. Mcallister SD, Chan C, Taft RJ, Luu T, Abood ME, Moore DH, et al. Cannabinoids selectively inhibit proliferation and induce death of cultured human glioblastoma multiforme cells. J Neurooncol. 2005;74:31–40.
2. Ligresti A, Moriello AS, Starowicz K, Matias I, Pisanti S, De Petrocellis L, et al. Antitumor Activity of Plant Cannabinoids with Emphasis on the Effect of Cannabidiol on Human Breast Carcinoma. J Pharmacol Exp Ther. 2006 May;318(3):1375–87.
3. Dumitru CA, Sandalcioglu IE, Karsak M. Cannabinoids in Glioblastoma Therapy: New Applications for Old Drugs. Front Mol Neurosci. Frontiers Media SA; 2018;11:159.
4. Marcu JP, Christian RT, Lau D, Zielinski AJ, Horowitz MP, Lee J, et al. Cannabidiol enhances the inhibitory effects of delta9-tetrahydrocannabinol on human glioblastoma cell proliferation and survival. Mol Cancer Ther. NIH Public Access; 2010 Jan;9(1):180–9
5. Holland ML, Panetta JA, Hoskins JM, Bebawy M, Roufogalis BD, Allen JD, et al. The effects of cannabinoids on P-glycoprotein transport and expression in multidrug resistant cells. Biochem Pharmacol. Elsevier; 2006 Apr;71(8):1146–54.

Surgical interventions for the early management of Bell's palsy

Menchetti Isabella, McAllister K, Walker D, Donnan PT

University of Edinburgh

INTRODUCTION: Bell's palsy is an acute paralysis of one side of the face of unknown aetiology. Bell's palsy should only be used as a diagnosis in the absence of all other pathology. As the proposed pathophysiology is swelling and entrapment of the nerve, some surgeons suggest surgical decompression of the nerve as a possible management option. This is an update of a review first published in 2011, and most recently updated in 2013.

OBJECTIVE: To assess the effects of surgery in the management of Bell's palsy.

PATIENTS AND METHODS: Search methods: On 18 June 2018, we searched the Cochrane Neuromuscular Specialised Register, CENTRAL, MEDLINE and Embase. We also hand searched selected conference abstracts for the original version of the review. **Selection criteria:** We included all randomised or quasi-randomised controlled trials involving any surgical intervention for Bell's palsy. We compared surgical interventions to no treatment, sham treatment, other surgical treatments or medical treatment. **Data collection and analysis:** Three review authors independently assessed whether trials identified from the searches were eligible for inclusion. Three review authors independently assessed the risk of bias and extracted data. We identified seven new studies when we updated the searches in June 2018.

RESULTS: Three trials with a total of 107 participants met the inclusion criteria. The first study considered the treatment of 403 people but only included 44 participants in the surgical trial, who were randomised into surgical and non-surgical groups. However, the report did not provide information on the method of randomisation. The second study randomly allocated 25 participants into surgical or control groups using statistical charts. The third study quasi-randomised 38

participants into surgical or control groups using alternation. Surgeons in all three studies decompressed the nerves of all the surgical group participants using a retroauricular/transmastoid approach. The primary outcome was recovery of facial palsy at 12 months. The first study showed that the operated group and the non-operated group (who received oral prednisolone) had comparable facial nerve recovery at nine months. This study did not statistically compare the groups, but the scores and size of the groups suggested that statistically significant differences are unlikely. The second study reported no statistically significant differences between the operated and control (no treatment) groups. The third study reported a statistically significant difference in the proportion of surgical participants who achieved a fair recovery at three-months. However this difference became non-significant at the end of follow-up at 12 months.

CONCLUSIONS: There is only very low-quality evidence from randomised controlled trials and this is insufficient to decide whether surgical intervention is beneficial or harmful in the management of Bell's palsy. Further research into the role of surgical intervention is unlikely to be performed because spontaneous recovery occurs in most cases.

REFERENCES: McAllister K, Walker D, Donnan PT, Swan I. Surgical interventions for the early management of Bell's palsy. Cochrane Database Syst Rev. 2011;2:CD007468.

First steps to treating a congenital urinary bladder disease

Mohamed Mohamed Azhar, Neil Stuart Roberts, Professor Adrian S. Woolf

University of Manchester

INTRODUCTION: Urofacial syndrome (UFS) is a rare congenital urinary bladder disease that presents with voiding dysfunction and abnormal facial expression on smiling. Two genes- heparanase 2 (HPSE2) and leucine-rich repeats and immunoglobulin-like domains 2 (LRIG2) are identified as being mutated in UFS. Proteins encoded by these genes have been immunodetected in the bladder nerves. UFS is believed to be a disease resulting from pathology in these nerves. The post-ganglionic axons of these nerves originate in the pelvic ganglion (PG). Gene delivery into the neurones of the PG is a key step towards developing a gene therapy for UFS. Adeno-associated viruses (AAV) have been used as viral vectors to transduce nerve cells in the body. This study aims to determine whether AAVs can be used to drive the expression of a reporter gene in bladder nerves, with the long-term goal of expressing therapeutic genes.

PATIENTS AND METHODS: Bladder and urinary tract outflow tissues were obtained from four mice. Two of them were previously injected with AAV9 carrying green fluorescent protein (GFP) as a reporter, under the control of a synapsin promoter, and the other two were control mice without the AAV injection. These tissues were immunostained for GFP and synapsin using immunohistochemistry (IHC).

RESULTS: GFP was detected in the PG neuronal cells and nerve axons. GFP was not present in the urothelium. Synapsin protein was localised to the PG neurons.

CONCLUSIONS: The results provide some proof of concept that therapeutic genes can be delivered into the cells of the PG for treating UFS.

REFERENCES:
1. Woolf AS, Stuart HM, Roberts NA, McKenzie EA, Hilton EN, Newman WG. Urofacial syndrome: a genetic and congenital disease of aberrant urinary bladder innervation. Pediatr Nephrol. 2014 Apr 9;29(4):513–8.
2. Pang J, Zhang S, Yang P, Hawkins-Lee B, Zhong J, Zhang Y, Ochoa B, Agundez JA, Voelckel MA, Fisher RB, Gu W, Xiong WC, Mei L, She JX, Wang CY.. Loss-of- Function Mutations in HPSE2 Cause the Autosomal Recessive Urofacial Syndrome. Am J Hum Genet. 2010;86:957–62.
3. Stuart HM, Roberts NA, Burgu B, Daly SB, Urquhart JE, Bhaskar S, Dickerson JE, Mermerkaya M, Silay MS, Lewis MA, Olondriz MB, Gener B, Beetz C, Varga RE, Gülpınar O, Süer E, Soygür T, Ozçakar ZB, Yalçınkaya F, Kavaz A, Bulum B, Gücük A, Yue WW, Erdogan F, Berry A, Hanley NA, McKenzie EA, Hilton EN, Woolf AS, Newman WG. LRIG2 mutations cause urofacial syndrome. Am J Hum Genet. 2013 Feb 7;92(2):259–64.
4. Benskey MJ, Kuhn NC, Galligan JJ, Garcia J, Boye SE, Hauswirth WW, Christian Mueller, Sanford L Boye, and Fredric P Manfredsson Targeted gene delivery to the enteric nervous system using AAV: A comparison across serotypes and capsid mutants. Mol Ther. 2015;23(3):488–500.

The long-term impact of a Mindfulness Programme in a Tier 3 Weight Management Service

Kayleigh Nicholson and Dr Petra Hanson

Warwick Medical School

INTRODUCTION: Mindfulness has been used increasingly in clinical practice and holds great potential in the management of eating behaviours (1-3). Until recently, the effect of mindfulness on weight loss had not been studied. In 2019, work by Hanson et al. found mindfulness was linked to increased weight loss, in addition to significantly improved eating behaviours (3). However, a number of limitations prevented true conclusions been drawn regarding the effectiveness and replicability of mindfulness in this setting (4). The current project aims to address a number of these issues with an increased number of participants and a more in-depth analysis of the impact of mindfulness sessions in obesity management services.

PATIENTS AND METHODS: Cohort study involving patients in a tier 3 obesity service who attended a Mindfulness Programme at University Hospitals Coventry and Warwickshire. The programme involved sessions teaching mindfulness skills for lifestyle-based obesity management. Techniques were utilised to improve both relationships with food and eating-related behaviours. Data regarding weight loss, HbA1C and cholesterol levels have been collected with pre and post-session comparisons conducted. Post-session weight was recorded every 6 months for a total of two years. Additional comparisons have been made between surgical and non-surgical patients and between male and female participants. Statistical analysis was conducted using Student t-tests ($P < 0.05$ considered statistically significant).

RESULTS: Demographics: 162 patients completed at least 3 of 4 sessions, 75% of these were female and 28% had bariatric surgery during the 2-year follow up period **Weight loss:** Average weight was significantly reduced at each 6-month interval compared to the pre-session average. Weight loss continued to increase at each 6-month interval, however, the rate of weight loss decreased after the initial 12 months **HbA1c:** There were no significant differences in HbA1c values before and after sessions. **Total cholesterol:** Significantly reduced following sessions in the non-surgical group, there was no significant difference in the surgical group

CONCLUSIONS: - Mindfulness has significant effects on weight loss - As the rate of weight loss decreases after 12 months, additional “refresher” sessions may be beneficial at this point

- HbA1c did not change however total cholesterol was significantly reduced - Further work over the coming months will continue to evaluate the full effects.

REFERENCES:

1. O'Reilly GA, Cook L, Spruijt-Metz D, Black DS. Mindfulness-based interventions for obesity-related eating behaviours: a literature review. Obes Rev. 2014 Jun;15(6):453-61. doi: 10.1111/obr.12156. Epub 2014 Mar 18.
2. Keesman M, Aarts H, Häfner M, Papies EK. Mindfulness Reduces Reactivity to Food Cues: Underlying Mechanisms and Applications in Daily Life. 2017.
3. Hanson P, Shuttlewood E, Halder L, Shah N, Lam FT, Menon V, et al. Application of Mindfulness in a Tier 3 Obesity Service Improves Eating Behavior and Facilitates Successful Weight Loss. J Clin Endocrinol Metab. 2019 Mar 1;104(3):793-800. doi: 10.1210/jc.2018-00578.
4. Black M. Mindful Eating for Weight Loss: Try Before You Buy. J Clin Endocrinol Metab. 2019 Mar 1;104(3):864-6. doi: 10.1210/jc.2018-02551.

Evaluating a latent tuberculosis infection screening and treatment programme targeting recent migrants

Kathryn O'Brien, Sabina Ikram, Matthew Burman, Heinke Kunst

Barts and the London School of Medicine and Dentistry

INTRODUCTION: The London borough of Newham has been established as a pilot for the national latent tuberculosis infection (LTBI) screening and treatment programme for recent migrants since 2014. In order to be effective, delivery of the programme requires collaboration between stakeholders across both primary and secondary care; we aimed to understand the lessons learned about running the service during the last 5 years.

PATIENTS AND METHODS: Semi-structured interviews were performed with nine multi-level stakeholders who were involved in the implementation and delivery of the programme. This included individuals from primary and secondary care, NHS England, Clinical Commissioning Group, and the local pharmaceutical committee. Interviews were carried out during the period 15th - 30th May 2019 and were organised around predetermined, open style questions.

RESULTS: Several barriers and facilitators to implementation and delivery of the programme were identified (table 1). Importantly, effective communication between multi-level stakeholders was identified as a facilitating factor, with those interviewed placing emphases on continuous review and training of service providers. Aggregate data collection, processing and monitoring were considered as facilitators. TB and LTBI education by healthcare providers and by novel educational tools, was also cited as an important facilitator. The key challenges identified by stakeholders included communication between healthcare providers, estimations of screening and treatment uptake and low levels of patient knowledge of TB and LTBI.

CONCLUSIONS: In order to achieve the national goal of systematic LTBI screening and treatment of recent migrants will require effective, high quality services to be established throughout the country. It is essential to share learning as the programme evolves. Evaluation of a large programme in East London identified that a continuous programme of TB education, effective collaboration between stakeholders and continuous aggregate data collection were felt to be vital for successful outcomes.

Use of the Mental Health (Care and Treatment) (Scotland) Act 2003 in the Royal Infirmary of Edinburgh

Wioletta Borkowska, Thomas Brook, Alexia Cochrane, Vaclav Loffelmann, John Mulholland, Eunsoo Park, Harin Wijayathunga, Dr Vikki Argent, Dr Douglas Murdie

University of Edinburgh

INTRODUCTION: The Mental Health (Care and Treatment) (Scotland) Act 2003 allows relevant healthcare professionals to detain patients who are unable to consent to treatment, and the use of this Act is rising. It's important for patients' rights that legal procedures when utilising the Act are being followed correctly so we aimed to review the use of the Act within the Royal Infirmary of Edinburgh (RIE).

PATIENTS AND METHODS: Records of all patients detained under the Act in the RIE between the 1st of January and 31st of December 2018 were obtained from Hospital Administrators. The corresponding notes and forms were then acquired from the local computerised medical records system (TRAK). Data including demographics, which type of section, duration, and ward, and whether forms were completed appropriately were obtained. This information was analysed and compared with wider data from the Mental Welfare Commission (MWC).

RESULTS: Overall 98 people were detained. 54% were male (n=53), with population-adjusted data indicating those aged 80-89 were most likely to be detained. July was the busiest month, in keeping with a population increase due to local international festivals. The largest group of detentions by time were Emergency Detention Certificates completed out-of-hours. Most patients were detained in the General Medicine (30%) and Toxicology (27%) wards. Regarding completion of forms, 31% were filled in incorrectly. The most common error was a lack of Mental Health Officer (MHO) consent (33%), although this was better than the MWC Lothian average. However, in 50% of these cases no reason was given for lack of consent. When required, ICD-10 criteria were not provided in 29% of cases.

CONCLUSIONS: Our findings indicate the need for training to limit errors, both widespread and potentially more targeted towards junior doctors in General Medical and Toxicology wards. Although MHO consent was sought more regularly than Lothian averages, errors could be further limited by said training or a greater specialist presence out-of-hours. The demographic findings could indicate a role for a specialist Old Age Liaison Psychiatrist within the RIE.

REFERENCES: Scottish Parliament. *Mental Health (Care and Treatment) (Scotland) Act 2003*[Internet]. UK Legislation. 2018 [cited 3 March 2019]. Available from: https://www.legislation.gov.uk/asp/2003/13/contents
Murray S, O'Regan R. *Audit & Survey of the use of the Mental Health(Care and Treatment) (Scotland) Act 2003 in the General Hospital (Aberdeen).* 2017.
Mental Welfare Commission for Scotland. *Mental Health Act monitoring data 2017/18.*2018.
The City of Edinburgh Council*. Census 2011 - Population, age structure and household overview*. 2013.

A prospective cohort study evaluating the performance of a new screening tool to identify intensive care unit survivors at high risk of 90-day unplanned hospital readmission

Ellen Pauley, Jo Thompson, Lucy Barclay, Eddie Donaghy, James Marple, Tim Walsh

University of Edinburgh Medical School

INTRODUCTION: A high 90-day unplanned hospital readmission rate has been reported in intensive care unit (ICU) survivor patients in Scotland (25%) [1]. Pre-critical illness factors e.g. pre-existing comorbidity, are stronger predictors of readmission than more acute factors [1,2]. The Preventing Early Unplanned Hospital Readmission After Critical Illness (PROFILE) study identified a dichotomy of readmission contexts: medically unavoidable readmissions, and readmissions resulting from complex health and psychosocial patient needs, which may have been preventable [3]. Factors contributing to readmission e.g. poor social support, were identified from patient and carer perspectives [3]. Supporting Community recovery and reducing reAdmission Risk Following critical illness (SCARF) is a quality improvement project with the aim of reducing this readmission rate by using a new screening tool to identify 'high risk' ICU survivors. This assesses risk factors for readmission based on those identified in the PROFILE study [3]. The screening tool was piloted whilst an anticipatory care pathway for high risk survivors was evaluated. The objective was to evaluate the validity and predictive value of the screening tool for 90-day unplanned hospital readmission, and inform whether the tool effectively identifies high risk ICU survivors.

PATIENTS AND METHODS: The population was ICU survivor patients. All ICU patients 01/06/2018 – 25/02/2019 at the Royal Infirmary Edinburgh were screened using the SCARF screening process. The SCARF-tool assessed previously identified risk factors for readmission: living alone, polypharmacy, pre-existing mental health/mobility problems, comorbidity. Post-ICU physical and psychological status was also assessed. The screening process was semi-subjective i.e. there was no cut-off number of risk factors required to screen SCARF-positive. The screening process was completed by 3 members of the SCARF team prospectively using information in the electronic medical record (TrakCare). The primary outcome was 90-day unplanned hospital readmission (also determined prospectively through TrakCare). The readmission rates in SCARF-positives and negatives were compared, and the tool performance was evaluated with diagnostic test parameters.

RESULTS: 946 ICU survivor patients were screened by SCARF 01/06/2018 – 25/02/2019: 257 (27.2%) and 689 (72.8%) screened SCARF-positive (high-risk of readmission) and SCARF-negative (low-risk) respectively. 99/194 (51.05%) SCARF-positives vs 102/510 (20.0%) SCARF-negatives alive at 90 days post-ICU discharge experienced 90-day hospital readmission. The relative risk of readmission was 2.55 (95% confidence intervals: 2.04-3.18) ($p<0.0001$) with screening SCARFpositive. The SCARF-tool was 49.3% sensitive and 81.1% specific. Positive and negative predictive values were 51.0% and 80.0%. Positive and negative likelihood ratios were 2.61 and 0.63.

CONCLUSIONS: The SCARF screening tool effectively identified ICU-survivors at high risk of 90-day readmission. The tool performed best as a rule-in test (to include high-risk survivors in the anticipatory care pathway). SCARF may therefore contribute to reducing the readmission rate by flagging up patients who require increased support in their recovery. However, not all readmitted patients screened as 'high- risk' and the proportion of unpreventable readmissions is uncertain. Future analysis and development of the SCARF anticipatory care pathway is warranted.

REFERENCES:

[1] Lone N, Gillies M, Haddow C, et al. Five Year Mortality and Hospital Costs Associated with Surviving Intensive Care. Am J Respir Crit Care Med. 2016;194 (2):198–208.

[2] Lone NI, Lee R, Salisbury L, et al. Predicting risk of unplanned hospital readmission in survivors of critical illness: a population-level cohort study. Thorax [Internet]. 2018 Apr 5;thoraxjnl-2017-210822. Available from: http://thorax.bmj.com/content/early/2018/04/05/thoraxjnl-2017-210822.abstract
[3]Donaghy E, Salisbury L, Lone N, et al. Unplanned early hospital readmission among critical care survivors: a mixed methods study of patients and carers. BMJ Qual Saf. 2018;27(11):915– 27.
NB - funded by Healthcare Improvement Scotland

Implementation of NEWS2 and the Recognition and Response to Deterioration in the Medical Assessment Unit, Western General Hospital

Anusha Rajanran, Dr Claire Gordon

University of Edinburgh

INTRODUCTION: The National Early Warning Score (NEWS) was developed by the Royal College of Physicians (RCP) in 2012 to promote early recognition of and a structured response to deterioration as these are key to reducing adverse patient outcomes. The NEWS was updated in 2017 – key updates include screening for acutely altered mentation and the addition of a new oxygen saturations scale for patients with type 2 respiratory failure. Following the introduction of NEWS2 across NHS Lothian in January 2019, the aim of this audit is to obtain a baseline measurement of its implementation in the MAU, review current practice on the structured response to deterioration, and to highlight areas for improvement.

PATIENTS AND METHODS: Following data collection over 15 days in February and March, the final dataset comprised of 321 patients. The MAU was evaluated in three categories related to the recognition of deterioration (monitoring frequency, use of the chronic hypoxia scale and assessment of mentation), and three related to the response (escalation of care, documentation of escalation and delivery of response) in consultation with RCP and NHS Lothian guidelines.

RESULTS: Out of the 269 patients who scored NEWS 1 or above, the minimum monitoring frequency was least met in the NEWS 7 or more group, with only 8.3% of patients having their vital signs monitored continuously. Only a third of patients scoring 3 in a single parameter had their observations monitored hourly. 28 patients were put on the chronic hypoxia scale but there was no documentation of confirmation of Type 2 respiratory failure and the grade of the doctor/nurse authorising the usage of the scale. 33 patients were identified as having acutely altered mentation; out of these only 12 were identified on the earlier nursing assessment.76.6% of patients scoring NEWS 5 or more and 44.1% of those scoring 3 in a single parameter were escalated to medical staff. The overall concordance between the documentation of escalation status on the NEWS charts and in the clinical notes is poor. 51.1% of patients being escalated are seen within the hour.

CONCLUSIONS: The major theme to arise from this audit is the need for an improvement in the shared understanding and communication between medical and nursing teams in the MAU in recognising and responding to deterioration. Following a multidisciplinary discussion, ideas of change such as joint education sessions can be applied and tested as part of the quality improvement cycle.

REFERENCES:
1. Resuscitation Council (UK) and Intensive Care National Audit and Research Centre. Key Statistics from National Cardiac Arrest Audit 2017-18 [internet]. 2019 [cited 10th May 2019]. Available from: https://www.icnarc.org/Our-Audit/Audits/Ncaa/Reports/Key- Statistics

2. Royal College of Physicians. National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS. Updated report of a working party [internet]. 2017 [cited 14th May 2019]. Available from: https://www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2

A systematic literature review of how electrical stimulation enhances the mechanisms of general and chronic wound healing

Saranya B Rajendran

Lancaster medical school

INTRODUCTION: Electrical stimulation (ES) has been suggested as a therapeutic modality to help heal wounds by mimicking the natural currents produced by our skin around injuries. ES can be used to accelerate the healing of chronic wounds, which have impaired healing due to complications from underlying pathology. This review aims to understand how ES affects the normal cellular mechanisms of wound healing and its clinical effectiveness in treating chronic wounds.

PATIENTS AND METHODS: Literature searches with no publication date restrictions were conducted using the Cochrane library, Medline, and PubMed databases to identify appropriate papers for this review.

RESULTS: 20 full-text articles met the inclusion criteria. Ten studies (four RCTs and six *in vitro* experiments) looked into the effect of ES on normal mechanisms of healing. Of these, five studies showed that exposure increases vascularity and skin perfusion around the wound. Four demonstrated bactericidal effects when exposed to alternating and pulsed current and four studies found increased epithelialization and fibroblast migration. For all reviewed studies, $p<0.05$. Six RCTs investigated the effect of pulsed current on chronic wound healing. All reviewed trials demonstrated a larger reduction in wound size and increased healing rate when compared to a control or sham treatment group. Long-term follow up was lacking in five out of six RCTs reviewed.

CONCLUSIONS: Electrical stimulation therapy not only contributes to improved wound healing but also reduces the financial burden associated with wound management. A definite type of ES cannot be recommended for treatment from this review as there are variations in the wound characteristics and ES specifications used across the trials. However, this could be a potential focus for future research to modify current regimens of chronic wound management in the UK.

REFERENCES:

· Khouri C, Kotzki S, Roustit M, Blaise S, Gueyffier F, Cracowski J-L. Hierarchical evaluation of electrical stimulation protocols for chronic wound healing: an effect size meta-analysis. Cochrane Central Register of Controlled Trials (CENTRAL) 2017; 31(5)
· Kloth LC. Electrical Stimulation for Wound Healing: A Review of Evidence From In Vitro Studies, Animal Experiments, and Clinical Trials. The International Journal of Lower Extremity Wounds. 2005;4(1):23-44.
· Zhao M, Bai H, Wang E, Forrester JV, McCaig CD. Electrical stimulation directly induces pre-angiogenic responses in vascular endothelial cells by signalling through VEGF receptors. J Cell Sci. 2004;117(3):397.
· Houghton PE, Kincaid CB, Lovell M, Campbell KE, Keast DH, Woodbury MG, et al. Effect of electrical stimulation on chronic leg ulcer size and appearance. Phys Ther. 2003;83(1):17-28.

A Comparison of the Complication Rates Between Open Surgical and Percutaneous Dilatational Tracheostomies in Critically Ill Adults

Aditi Ranjan, Dr Rachel Markham

Lancaster Medical School

INTRODUCTION: Tracheostomy is an invasive procedure which is performed for ventilation weaning and airway compromise. Two methods can be used to insert the tracheostomy tube – the surgical method (OST) which uses a 2-3cm incision, and the percutaneous method (PDT) which uses a dilator1.

PATIENTS AND METHODS:
Objective: To compare the complication rates between PDT and OST in critically-ill adults.
Methods: a literature search was carried out for trials published between 2004 and 2019. The percentage of patients suffering from complications reported in each of the studies was compared.

RESULTS: Eight studies ((six randomised controlled trials, a meta-analysis and an observational study) were reviewed. PDT was associated with significantly higher rates of difficult tube placement whereas OST was associated with increased rates of false passage, obstruction and infection. There were mixed results about which method had increased bleeding rates. Six of eight studies found that overall, there was no difference in the complication rates between the two methods for all other complications and on long-term follow-up2-9. One study found that OST patients had complications occurring at a significantly higher rate. This is likely due to the nature of the patient population itself, as people assigned to OST could inherently be at a higher risk of developing complications9. Interestingly, the meta-analysis reviewed contradicted the widely held belief that bronchoscopy results in fewer complications and found that bronchoscopy had no effect on safety8.

CONCLUSIONS: Overall, PDT and OST have similar rates of complications in critically-ill adults with no relative contraindications for tracheostomy. Therefore, other factors such as the patient's clinical condition and preferences should determine the type of tracheostomy they receive. It would be advisable for the practitioner performing the tracheostomy to evaluate the risks and benefits of bronchoscopy and decide whether to use it.

REFERENCES:
1. McGrath B. Comprehensive Tracheostomy Care: The National Tracheostomy Safety Project Manual (Advanced Life Support Group). (NTSP) NTSP, editor: Wiley-Blackwell; 2013. 164 p.
3. Antonelli M, Michetti V, Di Palma A, Conti G, Pennisi MA, Arcangeli A, et al. Percutaneous translaryngeal versus surgical tracheostomy: A randomized trial with 1-yr double-blind follow-up. Critical care medicine. 2005;33(5):1015-1020.
4. Silvester W, Goldsmith D, Uchino S, Bellomo R, Knight S, Seevanayagam S, et al. Percutaneous versus surgical tracheostomy: A randomized controlled study with long-term followup. Critical care medicine. 2006;34(8):2145-2152.
5. Lukas J, Duskova J, Lukas D, Paska J, Stritesky M, Haas T. Standard surgical versus percutaneous dilatational tracheostomy in intensive care patients. Saudi medical journal. 2007;28(10):1529-1533.
6. Youssef TF, Ahmed MR, Saber A. Percutaneous dilatational versus conventional surgical tracheostomy in intensive care patients. North American journal of medical sciences.2011;3(11):508-512.
7. Valizade Hasanloei MA, Mahoori A, Bazzazi AM, Golzari SEJ, Karami T. Percutaneous dilatational tracheostomy and surgically created thracheostomy in ICU patients. Journal of cardiovascular and thoracic research. 2014;6(1):43-46.

8. Yaghoobi S, Kayalha H, Ghafouri R, Yazdi Z, Khezri MB. Comparison of complications in percutaneous dilatational tracheostomy versus surgical tracheostomy. Global journal of health science. 2014;6(4):221-225.
9. Klotz R, Probst P, Deininger M, Klaiber U, Grummich K, Diener MK, et al. Percutaneous versus surgical strategy for tracheostomy: a systematic review and meta-analysis of perioperative and postoperative complications. Langenbecks Archives of Surgery. 2018;403(2):137-149.
10. Barbetti JK, Nichol AD, Choate KR, Bailey MJ, Lee GA, Cooper DJ. Prospective observational study of postoperative complications after percutaneous dilatational or surgical tracheostomy in critically ill patients. Critical Care and Resuscitation. 2009;11(4):244-249.

Artificial intelligence successfully predicts the anatomical locations of ventricular ectopy from 12-lead ECGs

Rohin K. Reddy[1,2], Ahran D. Arnold [1], James P. Howard [1], Matthew J. Shun-Shin [1], Ian J. Wright [1], D. Wyn Davies [1], Phang Boon Lim [1], Michael Koa-Wing [1], Norman Qureshi [1], David C. Lefroy [1], Fu Siong Ng [1], Nicholas S. Peters [1], Nick W. F. Linton [1], Prapa Kanagaratnam [1], Darrel P. Francis [1], Zachary I. Whinnett [1]

1 - National Heart and Lung Institute, Imperial College London, 2 - Hull York Medical School

INTRODUCTION: Ventricular ectopic (VE) ablation with radiofrequency energy can be performed for improvement of symptoms or prognosis. VE ablation is initially guided by analysis of the 12-lead surface electrocardiogram (ECG). Artificial intelligence techniques, such as machine learning, can be used to automate interpretation that usually requires expert human analysis. Localising VE foci accurately from the non-invasive 12-lead surface ECG could direct both vascular access and ablation location.

PATIENTS AND METHODS: Consecutive VE ablation cases were identified at a tertiary Cardiology centre. Only successful ablations, defined by elimination of ectopy for longer than 10 minutes postablation, were included. Procedure reports and stored fluoroscopy were used to identify successful ablation locations. Locations were defined as left ventricular outflow tract, left ventricular body, and right ventricle. Pre-ablation raw electrical VE data was extracted from the catheter laboratory ECG recording system and labelled with the ablation locations. A recurrent convolutional neural network was trained and validated on the location-labelled ECG data. For comparison, an algorithm adapted from published literature was used to manually analyse extracted ectopic QRS complexes and predict the VE location. The absence of S waves in leads II, III and aVF was considered predictive of outflow tract origin, with R/S transition in leads V1 or V2 considered predictive of left sided origin. The manual analysis was performed by 2 assessors who were blinded to ablation outcomes.

RESULTS: Between 2015 and 2018, 60 ablations met the eligibility criteria. In 27 ablations, invasive left ventricular mapping was performed, despite the VE ablation location being left-sided in only 21 cases. The recurrent convolutional neural network predicted VE location with 93% accuracy, which was significantly superior to chance ($p<0.0001$), but not significantly superior to the manual algorithm which achieved 90% accuracy.

CONCLUSIONS: Machine learning was able to successfully predict the anatomical locations of VE foci from the 12-lead surface ECG in this study. Accurate VE localisation, using artificial intelligence, could reduce unnecessary arterial or venous access for right or left ventricular foci, respectively. It may also reduce procedure time by guiding operators to the correct site within the ventricles more rapidly and reproducibly than human analysis alone.

Pharmaceutical industry; benefit or bias? A literature review evaluating Pharmaceutical industry support and the presence of bias in Respiratory Syncytial Virus burden of disease studies

Miss Emily Richardson

Edinburgh University

INTRODUCTION: Pharmaceutical industries are developing vaccines to prevent Respiratory Syncytial Virus (RSV) infections which cause a significant burden on healthcare systems worldwide. There is a mistrust in pharmaceutical industry supported research due to an association with bias (1). This literature review aimed to investigate industry support and the presence of bias in research investigating RSV-related burden of disease (BOD) on healthcare in Europe.

PATIENTS AND METHODS: Records which evaluated BOD of RSV in Europe were identified through a search on Medline and Embase, and screened using pre-defined criteria. Papers were evaluated with a bias questionnaire and then data extracted on author employment, affiliation with pharmaceutical industry and funding source. Following statistical analysis, outcomes were compared between industry supported studies and non-profit studies.

RESULTS: Industry supported studies are significantly more likely to pre-define procedures for excluding subjects, report confidence intervals, discuss limitations of the study and advise against treatment. However, industry supported studies are significantly less likely to measure exposure equally across all study groups.

CONCLUSIONS: Contradictory to previous research in randomised control trials, this study concludes, industry input does not affect the presence of bias. BOD data on RSV in Europe can be relied upon regardless of funding sources or author affiliation.

REFERENCES:

1. Taylor H. Oil, pharmaceutical, health insurance, and tobacco top the list of industries that people think should be more regulated. [Internet]. Media.mmmonline.com. 2010 [cited 8 May 2019]. Available from: http://media.mmmonline.com/documents/55/hi-harris-poll-industry-regula_13562.pdf

Rates of adherence to protocol and conversion to treatment among Black men on active surveillance for prostate cancer: The experience of a high-volume single centre.

Sohail Singh, Haleema Aya, Milad Golsharifi, Hannah Yonis, Anisah Khan, Preeti Sandhu, Nikhil Mayor, Paul Cathcart, Ben Challacombe, Rick Poppert, Prokar Dasgupta, Aida Santaolalla, Mieke Van Hemelrijck, Kerri Beckmann, Oussama Elhage

King's College London

INTRODUCTION: Black men, particularly those of African descent, are at greater risk of developing prostate cancer (PCa), tend to be diagnosed at an earlier age and may be prone to more aggressive disease. This raises concerns about whether Black men are suitable candidates for active surveillance (AS), even when diagnosed with low risk PCa. The objective of this study was to compare protocol adherence and outcomes among Black men with other ethnicities within the AS cohort at a single high-volume hospital in the United Kingdom.

PATIENTS AND METHODS: 568 men with confirmed PCa diagnosed (2004-2016) who had attended at least one (6 month) follow-up appointment at the AS clinic were included. Adherence to protocol (proportion of missed appointments) was ascertained from the electronic patient management system. Risk of disease progression (any upgrading, >30% positive cores, PIRADs>3) and conversion to treatment (prostatectomy, radiotherapy or hormone therapy) according to race (Black versus other ethnicities) were assessed using multivariable Cox proportional hazards regression.

RESULTS: 23% of the AS cohort were recorded as Black, while the remainder were predominantly white. Black men were slightly younger (61 v 65 years), had slightly lower PSA at diagnosis (median 5.3 vs 6.3 ng/mL) and on average had more positive cores at diagnosis (median 2 vs 1). Black men had a higher rate of non-attendance of scheduled follow-up visits (26% vs 12% missed >20% of appointments, $p<0.001$). After a median of 41 months of follow-up, 39% of Black men compared with 34% of other ethnicities had evidence of disease progression. However, the proportions converting to active treatment were similar: 27% and 28%, respectively. Neither risk of disease progression (HR: 1.13; 95% CI 0.77- 1.64) nor risk of converting to treatment differed by race (HR: 1.12; 95% CI 0.73-1.72) after considering differences in disease characteristics and appointment attendance.

CONCLUSIONS: Black men with low risk PCa on active surveillance are less likely to adhere to surveillance protocols or to convert to treatment when appropriate. This may have future implications for long term oncological outcome for this group of patients. A more tailored service addressing the needs of this cohort of patients may be required.

REFERENCES: "2011 Census: Ethnic group, local authorities in England and Wales". Office for National Statistics. 11 December 2012. Retrieved 22 March 2019

An audit on annual HbA1c testing in women with a history of gestational diabetes

Radhika Shah

University of Nottingham

INTRODUCTION: Gestational diabetes (GD) is defined as hyperglycaemia detected by a fasting plasma glucose level of 5.6 mmol/litre or above during pregnancy. Women diagnosed with GD are at an increased risk of developing type 2 diabetes (T2DM) postpartum; therefore, HbA1c should be monitored postnatally. We aimed to calculate the number of GD women within primary care that have their annual HbA1c measurement.

PATIENTS AND METHODS: Patients were found within a General Practice in Derby, United Kingdom. Women recorded with GD were found on SystemOne using codes. The HbA1c test after a year of diagnosis was then searched. For women that did not have the annual HbA1c, any recalls or reminders for the test were noted as well as any letters sent out to the patients requesting for a blood test.

RESULTS: 31 women were found on SystemOne with a history of GD prior to 2018, out of which 20 patients (65%) had no annual HbA1c test. Of these 20, 50% (n=10) had no evidence the test was required, 25% (n=5) were due for testing, 15% (n=3) did not attend despite reminders and the remaining 10% (n=2) had documentation in the notes for monitoring but weren't notified.

CONCLUSIONS: Patients with GD are not receiving appropriate post-partum monitoring in primary care. At the 6-week post-natal check GP'S in this practice will now confirm a history of GD and if so

the test is then booked. Following this intervention, a re-audit is required to assess if patients are being appropriately monitored.

REFERENCES: National Institute for Health and Care Excellence. Diabetes in pregnancy : management from preconception to the postnatal period [Internet]. National Institute for Health and Care Excellence. 2015. Available from: nice.org.uk/guidance/ng3 Diabetes in pregnancy, NICE quality standard [Internet]. 2015. p. 25–6. Available from: https://www.nice.org.uk/guidance/qs109/documents/diabetes-in-pregnancy-qs-draftguidance-for-consultation2

The quality of electronic discharge summaries- insights from an audit in a London teaching hospital

Hussein Al-Fazly, Riddhi Shenoy, Sameer Zuberi, Raymond Anakwe

Imperial College London

INTRODUCTION: Discharge summaries are important for safe and effective transfer of care. The Professional Records Standards Body (PRSB) has published national standards for electronic discharge summaries, which outline 'Mandatory', 'Required', and 'Optional' elements for electronic discharge summaries (1).

METHODS: We retrospectively audited e-discharge summaries of all adult patients who presented to St Mary's Hospital A&E department during a 24-hour period in December 2018 and were subsequently admitted into an inpatient ward at St Mary's Hospital. E-discharge summaries were assessed for the presence and accuracy of all 'Mandatory' and some 'Required' elements of the PRSB standards.

RESULTS: 33 e-discharge summaries were included in the audit. Many automatically populated fields, such as those containing patient and GP identifying information, were present and correct in 100% of cases. However, we identified 3 technical errors, with one leading to 58% of patient addresses being truncated. Among fields requiring more manual input, adherence to standards was lower, ranging between 61-91%, with the main issue being absence of information rather than false information. Most significantly, the list of ongoing medication was absent in 33% of cases, and when present it was limited by the quality of documentation of medications on admission. Two 'Required' elements, 'plan and requested actions' and 'information and advice given', when present, were frequently merged into the 'clinical summary' free text field, indicating a lack of consistent formatting.

CONCLUSIONS: Automatic population of fields in e-discharge summaries resulted in good adherence to some of the basic PRSB standards, but this was prone to technical error and limited to basic information, while the bulk of clinically important information still needed to be added manually. E-discharge summaries were also limited by the quality of electronic records, inconsistency of formatting and overcrowding of free-text information.

REFERENCES:
1) Professional Records Standards Body. (n.d) E-discharge Summary PRSB. Available from: https://theprsb.org/standards/edischargesummary/ [Accessed 8th May 2019]

Renal maturation in the neonates, consideration for postnatal surgery for ureteropelvic junction obstruction

Alireza Sherafat

University of Central Lancashire

INTRODUCTION: The focus of this literature review is on surgical management of ureteropelvic junction obstruction (UPJO), which is the most common type of congenital anomalies of the kidneys and urinary tract (Liang et al., 2018).

PATIENTS AND METHODS: PubMed filters were used to include English articles related to human studies from 1/1/2002 to 1/1/2018 that both abstract and full text were available. Moreover, the age group was chosen as new born: birth-1 month to limit the search results. Six sets of search terms were used to look at UPJO surgical management

RESULTS: The initial search identified 97 publications. 77 papers were excluded at screening and eligibility-check stages. 20 articles were included in the review. Recurrent UPJO was seen as a complication of open dismembered pyeloplasty in 5.2% of neonates (Braga et al., 2008). In a retrospective study of 75 neonates with UPJO by Garg.,et al (2013) 49 underwent open dismembered pyeloplasty and 26 underwent laparoscopic pyeloplasty by one surgeon, operative time, post-op results result, complications and length of hospital stay were assessed in both groups by renal ultrasound. Transition from open surgical approach to laparoscopic practice seems to be successful (Polok et al., 2011).

CONCLUSIONS: Surgical approach is used for management of grade 3-4 hydronephrosis. Open surgery is regarded as the gold standard. The current trend is towards more laparoscopic managements. There is a need for more prospective, long-term and large cohort studies in the future to discover more about indicative factors for surgical management of UPJO.

REFERENCES: Braga, L. H. P., Lorenzo, A. J., Bägli, D.,J., Keays, M., Farhat, W. A., Khoury, A. E., & Salle, J. L. P. (2008). Risk factors for recurrent ureteropelvic junction obstruction after open pyeloplasty in a large pediatric cohort. *The Journal of Urology, 180*(4), 1684-1687. 10.1016/j.juro.2008.03.086 Garg, M., Goel, A., & Patil, S. (2013). Re: Ebadi et al.: Endoureterotomy as the initial management of concurrent ureteropelvic and ureterovesical junction obstruction after failed conservative therapy (urology 2013;82:214-219). *Urology, 82*(4), 977-978. 10.1016/j.urology.2013.05.036 Liang, C., Cheng, P., Lin, C., Chen, H., Chao, A., & Chang, S. (2002). Outcome of prenatally diagnosed fetal hydronephrosis. *The Journal of Reproductive Medicine, 47*(1), 27-32. Polok, M., Chrzan, R., Veenboer, P., Beyerlein, S., Dik, P., Klijn, A., de Jong, T. (2011). Nondismembered pyeloplasty in a pediatric population: Results of 34 open and laparoscopic procedures. *Urology, 78*(4), 891-894. 10.1016/j.urology.2011.04.039

The current most essential determinants to infant, child and maternal health in Sierra Leone

Vafie Sheriff

St Georges University of London

INTRODUCTION: Sierra Leone is one of the poorest countries in the world, suffering from some of the worst maternal and child health outcomes. The purpose of this study is to determine the current

most essential determinants to infant, child and maternal health and recommend some interventions and policy changes to improve health outcomes for women and children in the country.

PATIENTS AND METHODS: The study included a small review of relevant policies and papers and analysis of relevant maternal and child health data and statistics to inform questions for Key Informant Interviews. Semi-structured in-depth interviews were then conducted with relevant stakeholders to infant, child and maternal health in Sierra Leone. 11 Key Informant Interviews were conducted with stakeholders from UN Organisations, international NGOs and the Ministry of Health and Sanitation (MoHS). The Interviews were transcribed verbatim and the transcripts coded and analysed using NVIVO. The study received ethical approval from the St Georges Research Ethics Committee and the Sierra Leone Scientific Ethics Review Committee.

RESULTS: Three main areas discovered to be important to understand the current most essential determinants to maternal and child health : the current landscape of maternal and child health; the determinants affecting maternal and child health; and lastly the opposing perspectives of the MoHS and partners (UN Organisations and iNGOs) on what the most essential determinants in the country were.

CONCLUSIONS: The most essential determinants identified were the lack of effective coordination between the MoHS and partners due to the emergency mindset, systematic problems with the attitude of the healthcare workforce especially towards women and sociocultural restriction on women limiting their ability to make choices about their own health and lives. Interventions focused on women's empowerment and increasing their voices will help tackle most of the determinants linked to a woman's socio-economic status.

REFERENCES:

1. Figueroa, C. A., Linhart, C. L., Beckley, W. and Pardosi, J. F. (2018) 'Maternal mortality in Sierra Leone: from civil war to Ebola and the Sustainable Development Goals', International Journal of Public Health. Springer International Publishing, 63(4), pp. 431–432.
2. Wulifan, J. K., Brenner, S., Jahn, A. and De Allegri, M. (2016) 'A scoping review on determinants of unmet need for family planning among women of reproductive age in low and middle income countries', BMC Women's Health. BioMed Central, 16(1), p.2.

Analysing patterns of non-attendance at a community gynaecology clinic

Sabrina So, Dr. Rosemary Cochrane

University of Edinburgh

INTRODUCTION: Patients who do not attend their appointments (DNA) cause more than just an economic strain on the NHS, they also negatively impact the efficiency of the care that attending patients receive. This study aimed to identify the rate and patterns of non-attendance at a community gynaecology service and to evaluate the efficacy of a text-reminder system at reducing DNAs.

PATIENTS AND METHODS: Data on 567 patients who were invited to attend the outpatient medical gynaecology clinic at Chalmers Sexual Health Centre was collected through the clinic's appointment booking programme NaSH. Information about age, SIMD quintile, presenting complaint, and source of referral was then analysed using the IBM SPSS 24 programme.

RESULTS: The rate of non-attendance at the clinic was 10.7% which was higher than the national rate. There was a reduction in non-attendance after text-alerts were introduced. *(P*=0.035) An association between younger age groups and increased likelihood to DNA was identified. *(P= 0.018)* There was no association found between level of deprivation, source of referral, or reason for referral and non-attendance.

CONCLUSIONS: Overall, there is still much room for improvement in reducing non-attendance, however; the success of the text-alert system has inspired interest in developing technology-based interventions for future study. Such strategies may be vital to reducing the DNA rate in young people, who are currently overrepresented in the non-attending population.

REFERENCES: Robertson R, Wenzel L, Thompson J, Charles A. Understanding NHS financial pressures. King's Fund [Internet]. 2017;(March):1–126. Campbell K, Millard A, McCartney G, McCullough S. Who is least likely to attend? : an analysis of outpatient appointment 'Did Not Attend' (DNA) data in Scotland. 2015 ACT Academy-NHS Improvement. Reducing did not attends (DNAs). Online Library Quality Service Improvement Redesign Tools [Internet]. 2017 Ellis DA, McQueenie R, McConnachie A, Wilson P, Williamson AE. Demographic and practice factors predicting repeated non-attendance in primary care: a national retrospective cohort analysis. Lancet Public Health [Internet]. 2017;2(12):e551–9.

Impact of the 2011 NICE/BHS hypertension guidelines on specialist hypertension clinic services

Li En Tan, Linsay McCallum, Sandosh Padmanabhan

University of Glasgow

INTRODUCTION: In 2011 NICE, in collaboration with the British Hypertension society, updated their hypertension guidelines. These guidelines made some major changes to how hypertension is diagnosed and treated, which are - Diagnosis should be made via ABPM (or home monitoring where this is not tolerated), rather than relying just on clinic BP. - Where clinic blood pressure is high, ABPM is now required to confirm the diagnosis of hypertension. Some have questioned the basis of using ABPM for diagnosis, arguing that there is little evidence for it. While we have outcome trials available for treating based on clinic BP, we have nothing similar for treating based on ABPM. With this audit, we aimed to assess the impact the updated BHS/NICE 2011 guidelines have had on new referral to, and care delivery at Glasgow tertiary hypertension clinics.

PATIENTS AND METHODS: Clinical data from new referrals to the GBPC was audited in two patient groups. The first patient group we have called the NICE group. These are new patients first seen from May 2014 to February 2016 who were assessed and treated under the 2011 guidelines, with data being extracted from case notes. The second group is called the pre- NICE group. These are new patients first seen from January 2007 to December 2008. This is a group of patients treated under the 2006 guidelines with data extracted from GBPC database. In the NICE group, a total of 504 patients underwent ABPM. We were able to determine the type of hypertension in 449 of these patient using both clinic BP and ABPM (Hypertension: 43.9%; White coat hypertension: 26.7%; Masked hypertension: 8.9%; Normotensive: 20.5%)

RESULTS: Our results indicated that a significantly fewer number of patients are being started on medications following the introduction of the NICE 2011 guidelines. Within the NICE group, 320 untreated patients were referred that underwent ABPM. We have applied both the 2011 and 2006 guidelines to this group to compare the rate of treatment initiation. With application of the 2011 guidelines, 32.5% of patients had treatment initiated, 67.5% of patients remained untreated. When

the 2006 guidelines were applied to this same group, 50% of patients have treatment initiated and 50% were untreated. Consequently, 17% fewer people are being treated who would have been treated prior 2011.

CONCLUSIONS: There is an increase in the number of referrals for ABPM to establish diagnosis of HTN. This means that more patients with less severe hypertension are referred to tertiary care BP clinic. Hence less time slots available for patients with more complex HTN. We therefore decided to implement nurse led service for ABPM measurement in hope that this will ensure more time for doctors to see patients. Implementation of nurse led service is able to ensure more time and resources being available to more HTN and more complex patients, and this will lead to greater efficiencies in the assessment and management of patients.

Automated classification of colorectal cancer tissue using convolutional neural networks

Kaiwen Wang, Alexander Wright, Darren Treanor

University of Leeds

INTRODUCTION: Colorectal cancer (CRC) is the second largest cause of cancer mortality in the UK. With early diagnosis and appropriate treatment, 57% of patient can survive for 10+ years. Both diagnoses and treatment decisions are made manually typically on glass slides. Manual analysis of tissues requires visual inspection of highly complex cellular structures, which is time consuming, subjective and prone to error. Deep Learning (DL) has the potential to automate this task, improving on speed, objectivity and accuracy. Current research at the University of Leeds uses DL algorithms to classify CRC tissue in order to automatically predict response to therapy. However, it requires cancer tissue to be annotated by a pathologist prior to analysis which has the same disadvantages. This project aims to develop a DL algorithm to detect CRC on digital slides, as a preprocessing step for downstream image analysis.

PATIENTS AND METHODS: 11,977 images from UMM and NCT tissue banks were used to train and test a modified version of the Resnet18 convolutional neural network. Each of the images was manually annotated as one of three classes: tumour (colorectal cancer and stomach cancer epithelial tissue); stroma and muscle; adipose and mucus. The model was trained and tested using a 5-fold cross validation methodology. The model was evaluated on 750 colorectal images from a CRC clinical trial dataset. For each image, heatmaps were generated to illustrate the probability of each class within the whole-slide image and compared with existing pathologist annotations. Jaccard and Dice similarity, detection accuracy and tumour to stromal ratio (TSR) was then used to assess efficacy of model.

RESULTS: The model attained validation accuracy of with an AUC of lowest 0.989. When applied to the validation dataset, the preliminary tumour heatmap overlapped with pathologists' annotation with a median Jaccard similarity of 0.4278 (SD = 0.2390), a median Dice similarity of 0.5992 (SD = 0.2637) and median tumour detection accuracy of 0.8682 (SD = 0.0796). TSR achieved an overall accuracy of 54.7%. Current results are attributed to limited numbers of training examples, poor staining quality and image quality issues.

CONCLUSIONS: Early results from the preliminary study suggests the potential of robust automatic detection of colorectal cancer to allow for higher throughput of patient samples, allowing pathologists to make better treatment decisions based on consistent and reliable measurements. Different algorithm model, more training classes and higher-quality images will be explored to improve accuracy.

REFERENCES: Kather, J. N., Pearson, A. T., Halama, N., Jäger, D., Krause, J., Loosen, S. H., Luedde, T. (2019). Deep learning can predict microsatellite instability directly from histology in gastrointestinal cancer. *Nature Medicine*, 1. https://doi.org/10.1038/s41591-019-0462-y

Patient Awareness Questionnaire in Signposting QI Project

Graham Wardall, Supervisors: Dr Katarina Forsyth, Dr Sophie Bennett

University of Glasgow

INTRODUCTION: During my junior elective at Inchpark Surgery, Edinburgh, I participated in the practice's signposting/care navigation QI project. One of my contributions to the project was to develop a questionnaire that would allow the practice to gain an insight into what patients already know with regards to signposting in primary care. **Aims**: To identify which services patients are aware of at Inchpark Surgery; to find out how patients keep informed with updates to services; and to find out when patients would attend a healthcare service, other than their GP, as their first port of call with a query or problem.

PATIENTS AND METHODS: Patient Awareness Questionnaires were handed out to patients with any appointment at Inchpark Surgery from Mon 15/07/19 09:00 - Wed 17/07/19 12:00. The questionnaire was adapted from Healthcare Improvement Scotland's sample form (available from: ihub.scot). **Q1** of the survey asked patients which services at the practice they are aware of. **Q2** aimed to find out where patients keep informed of changes to practice services and find information. **Q3** asked when patients would signpost themselves to alternative healthcare providers other than GP or practice nurse as first port of call. **Q4** asked whether patients would be happy to give information about their problem to a receptionist. **Q5** asked if patients are aware of self-care and health advice websites such as NHS inform.

RESULTS: 110 patients completed the questionnaire. **Q1**, 21% were aware that there is a practice pharmacist, 12% knew there is a link worker and 12% were aware of access to the National MSK helpline. **Q2**, 44% observe waiting room posters. 24% use the website/internet. 20% use social media. 5% read local print media and 5% use TV for major changes. **Q3,** 95% said that they would attend a dentist with a mouth/gum/tooth concern. 89% would go to the optician with an eye problem. 81% would go to the pharmacy first with a medication query. With pharmacy PGDs, 41% said they would attend the pharmacy with conjunctivitis or impetigo, and 32% with a UTI. Only 18% would use the national MSK helpline with a back/muscle/joint complaint. **Q4**, 87% stated that they would give brief information to the receptionist. **Q5**, 62% said that they were aware of self care and health advice websites.

CONCLUSIONS: The practice nurse was unsurprisingly the most well-known non-GP service. The practice pharmacist and link worker are currently referral only appointments; there is a need for increased awareness of these among HCPs and patients. Few patients were aware of telephone access to MSK helpline. A significant proportion of patients observe information presented in the waiting rooms, proving an effective source of conveying information to regular attendees. The strong potential of the practice website and social media to promote information was also demonstrated. Most patients answered that they would signpost themselves to a dentist or optician when appropriate; whilst four fifths would go to the pharmacy first with a medication query. These results highlight that posters recently added to the waiting room are already promoting signposting knowledge. The pharmacy PGDs were less popular. However, they were still acknowledged by 41 and 32% of the patients showing some awareness. Again, the MSK helpline proved unpopular.

87% of patients happy to share information with the receptionist is promising when looking to raise the quantity of signposting being done. Legitimate self-care and health advice websites could be promoted more widely.

REFERENCES:
Survey based on Healthcare Improvement Scotland Patient Awareness Questionnaire.

Recognising and Reporting Child Abuse in Clinical Practice: A Qualitative Study of Paediatricians in Bogotá, Colombia.

Catherine Whiteside, Professor Frans Feron & Professor Angela Pinzon

Queens University Belfast

INTRODUCTION: Child abuse (CA) is a global phenomenon associated with multiple consequences for those affected, at all stages of the life course. CA is extremely prevalent worldwide but overwhelmingly underreported and under recognised, meaning the scope of the problem is often underrepresented. Paediatricians are in a unique position to identify and stop cases of child abuse from escalating. This purpose of this study was to identify potential barriers amongst paediatricians in recognising and reporting child abuse cases in their clinical practice. UNICEF highlighted that in Colombia, careful attention was required to tackle violence against children, as some people considered exploitation and abuse of as normal or acceptable. They also highlighted that there is an 'insufficient budget, services and trained human resources at local levels to meet the needs of children'.

PATIENTS AND METHODS: A review of relevant literature highlighted the trend of under recognition and underreporting of suspicious cases of abuse and described confusion and inconsistencies in paediatrician's role and involvement in detection and reporting. This descriptive phenomenological study utilised a qualitative research design with 9 in-depth semi structured interviews, conducted with paediatricians working in clinical practice in Bogotá, Colombia.

RESULTS: The results of this study highlight a number of factors which influence paediatricians in their recognition and subsequent reporting of abuse. The main barriers noted were fear, inadequate training and guidelines and lack of confidence or understanding in the follow up process. Factors which were shown to positively impact on reporting included the role of the multidisciplinary team, level of perceived responsibility, and their relationship and level of communication with the patient and their family. These factors were all shown to impact on a paediatricians clinical reasoning in determining if a child is being abused and if they should report it, along with their gut feeling and ability to identify signs of abuse.

CONCLUSIONS: Child abuse is a complex interplay of factors, with a large difficulty in clinical practice in identifying the 'cut off' between normal parenting and abuse. This study highlighted the need for standardisation and renewal of training on child abuse for paediatricians throughout their undergraduate and postgraduate career, with screening tools and guidelines that would increase paediatricians' awareness and confidence in dealing with child abuse. The results of the study highlight a framework with a complex interlinking and interdependency of factors affecting clinical practice with no 'one size fits all approach' in regard to recognising, reporting and safeguarding an at-risk child.

REFERENCES: Gilbert, R., Kemp, A., Thoburn, J., Sidebotham, P., Radford, L., Glaser, D., & MacMillan, H. L. (2009). Recognising and responding to child maltreatment. The lancet, 373(9658), 167-180.

World Health Organisation, Child maltreatment. (2016). Retrieved from https://www.who.int/news-room/fact-sheets/detail/child-maltreatment Christian, C. (2015). The Evaluation of Suspected Child Physical Abuse. Pediatrics, 135(5), e1337- e1354. doi: 10.1542/peds.2015-0356 Jackson, A. M., Kissoon, N., & Greene, C. (2015). Aspects of abuse: recognizing and responding to child maltreatment. Current problems in pediatric and adolescent health care, 45(3), 58-70. Castillo, C., Isaza, L., Bechara, S., Rodríguez, J., & Martínez, M. (2015). Building a comprehensive child protection system in Colombia: The architecture, cost and gaps. UNICEF. Retrieved from: https://www.unicef.org/protection/files/Colombia_CP_system_case_study.pdf

Risk of Venous Thromboembolism in Patients Undertaking Air-Travel Post-Lower-Limb Arthroplasty: A Systematic Review and Meta-Analysis

Harin Dinuja Wijayathunga, Colin Holton, Hemant Pandit

H.D. Wijayathunga is a student of the University of Edinburgh but the research was conducted in and by the University of Leeds

INTRODUCTION: Recent surgery and air-travel are both risk factors for venous thromboembolism (VTE). However, there is a lack of clarity as to whether individuals who fly post-lower-limbarthroplasty present with an increased incidence of symptomatic VTE compared to those who do not fly post-surgery. With increasing medical tourism as well as increasing numbers of patients undergoing arthroplasty, it is important to establish as to whether there is an increased risk in VTE post-lower-limb-arthroplasty. In addition, it will be helpful in patient counselling if impact of flight duration could be established.

PATIENTS AND METHODS: The databases: Cochrane Library, Medline, Trip, Web of Science and GALE were searched using broad search criteria for eligible case series or cohort studies investigating the incidence of VTE in individuals flying post-hip and post-knee arthroplasty. A meta-analysis and a review of literature were conducted.

RESULTS: There is a significantly higher risk of sustaining DVT in patients undertaking air-travel postlower-limb-arthroplasty as compared to those who didn't fly post-arthroplasty (OR = 3.66, 95% CI 1.37-9.76Similar trends were noticed post hip or knee arthroplasty. Impact of duration of flight on risk of VTE could not be established because of a lock of data.

CONCLUSIONS: There is an increased incidence of DVT in patients who flew post-arthroplasty. Current literature does not provide clear evidence about the impact of duration of flight as well as the time at which patients undertook a flight post-surgery. Future work should look into these factors as well as the type and duration of prophylaxis.

Preclinical investigation of eCF506's antiproliferative properties in cell models of ovarian cancer

Anna Wijngaard

University of Edinburgh

INTRODUCTION: SRC kinase plays a role in governing cellular functions and its activity in cancer has been extensively researched over the past century. SRC can be hyperactive in ovarian cancer, driving oncogenesis. Inhibition of SRC may therefore present favourable outcomes. Existing inhibitors such as Dasatinib lack selectivity for SRC, meaning they inhibit other kinases alongside SRC, leading to side effects like cardiotoxicity. A recently developed SRC inhibitor, called eCF506, was found to exhibit

high potency and selectivity for SRC. This preliminary study assessed the potential for eCF506 in ovarian cancer management.

PATIENTS AND METHODS: Cell viability assays were used, testing the effect of eCF506, Dasatinib, Bosutinib and Cisplatin (along with combinations) on proliferation of ten ovarian cancer cell lines. Western blots were performed to identify potential biomarkers and confirm inhibition of downstream targets.

RESULTS: eCF506 reflected slightly lower antiproliferative potency across the cell lines, but decreased inhibition of off-targets like ABL kinase. eCF506 also showed more than double the amount of phospho-SRC inhibition seen with Dasatinib. Proliferation decreased in all ten cell lines; eight of which demonstrated high sensitivity to SRC inhibition, with submicromolar GI50 values. The high-grade serous ovarian cancer cell lines were most sensitive. Moreover, phospho-SRC and phospho-FAK (downstream target of SRC) levels were found to correlate significantly with response, indicating their potential as biomarkers. Combination treatments of Cisplatin with eCF506 revealed additional benefit.

CONCLUSIONS: Overall, eCF506 demonstrates great potential in ovarian cancer management, exhibiting improved selectivity, and near-equal antiproliferative potency in comparison to its competitors. Further research is required to expand on the sample size and confirm these trends in vivo.

ACKNOWLEDGEMENTS: Kind thanks to Prof. Asier Unciti-Broceta and the members of his lab group at the Institute for Genetic and Molecular Medicine, Cancer Research UK, in Edinburgh, for their support during my project.

Estimating the burden of dementia in Latin America and the Caribbean—a systematic review and meta-analysis

Yawen Xiang, Kit Chan, Igor Rudan

The University of Edinburgh

INTRODUCTION: Dementia is a leading cause of morbidity and mortality among the elderly population. It affects around 47 million people worldwide, among whom around 60% reside in low- and middle-income countries (1). In Latin America and the Caribbean (LAC), population ageing is in rapid progress. However, detailed and up-to-date dementia epidemiology estimates are rare. Bayesian methods have recently gained recognition over traditional frequentist approaches for modelling disease burden for their superiority in dealing with severely limited data. This systematic review and meta-analysis aimed to quantify the prevalence of dementia in LAC from 2013 to 2018, with projections until 2020. It compares estimates using both the frequentist and Bayesian approaches and to provide methodological insights for future disease burden estimates.

PATIENTS AND METHODS: A comprehensive systematic literature search was conducted to identify all relevant primary studies that have reported the prevalence of dementia in the general population of LAC across PubMed, EMBASE, PsycINFO, Global Health and LILACS. The search was restricted to studies published in English and between 1 January 2013 and 10 December 2018 to identify the most up-to-date evidence. The included papers were critically appraised with the aid of the modified Joanna Briggs Institute Critical Appraisal checklist for prevalence studies. A random-effects model (REM) and a Bayesian normal-normal hierarchical model (NNHM) were used to obtain the pooled prevalence estimate of dementia for people aged 60 and above in LAC. The latter model was also

was developed to estimate age-specific dementia prevalence. Using UN age-specific population estimates, the total number of people affected by dementia in 2015 and 2020 were calculated.

RESULTS: Based on the REM, the prevalence of dementia in people aged 60 and above in LAC was found to be 14% (95%CI 10-21%) in both sexes, 13% (9-19%) in males and 15% (10-22%) in females. According to the Bayesian NNHM, the age-specific prevalence was 2% (1-4%) in people aged 60-69, 9% (5-13%) in people aged 70-79 and 29% (20-37%) in people over the age of 80. The standardised prevalence of dementia in LAC in people over 60 years of age was 8% (5-11.5%). In LAC, it is estimated that around 5.68 million people lived with dementia in 2015. This figure will increase to 6.86 million in 2020.

CONCLUSIONS: The findings of this systematic review suggest a substantial burden of dementia in LAC, which is significantly higher than the previous estimate (1). With the trend of demographic ageing in the coming decades, the prevalence and burden of dementia will continue to increase. An urgent response is needed to address this important and growing public health issue. We reaffirmed that the Bayesian method was the preferable method for metaanalysis involving fewer studies. The Bayesian estimates were more robust, evidence-based and precise.

REFERENCES:

(1) Prince M, Bryce R, Albanese E, Wimo A, Ribeiro W, Ferri CP. The global prevalence of dementia: a systematic review and metaanalysis. Alzheimers Dement, Elsevier Ltd; 2013;9(1):63–75.e2.

Documentation of patient parental status in a mental health inpatient unit

Mustafa Yaseen, James Barraclough , Alicia Dhesi, Chloe Hooley, Aamer Sajjad, Annie Darby

Hull York Medical School

INTRODUCTION: The Royal College of Psychiatrists have released a report (The Royal College of Psychiatrists, 2011) stating the importance of parental status to the identity of mental health patients. The acknowledgement of their psychological needs as parents is imperative to their well-being. Furthermore, such information can be crucial for the safeguarding teams for both the patients and their children. There was no standard procedure for the recording of parental status in a psychiatric inpatient unit in Lincolnshire. The service did have a tab presenting information on the relatives of their patients in their computer system. However, the information in it was usually incomplete.

PATIENTS AND METHODS: A Plan Do Study Act cycle was used to facilitate change. Patient data regarding the documentation of presence of any children, their name(s), their age(s), their school(s) and their contact details were taken from their records. With the help of the hospital administration, a session was arranged to inform the doctors working in the facility of the importance of the matter to encourage the practice. Finally, a form for the purpose of collecting the parental information was designed.

RESULTS: The proposed form was accepted and it was added to the admission package the hospital uses to collect information from all the patients that enter their care. The form is to be filled by the inpatients upon their admission as standard practice with the assistance of a healthcare worker in the institution. safeguarding lead reviewed our findings and agree that this information needs collecting and exploration of discrepancies or breaches has been recommended.

CONCLUSIONS: Incorporation of the form will ensure that the parental status of inpatients in the hospital will not go unacknowledged. This should also make it easier for social services to contact the children if the need ever arises.

REFERENCES:

The Royal College of Psychiatrists (2011). Parents as patients: supporting the needs of patients who are parents and their children. [online] Available at: https://www.rcpsych.ac.uk/docs/defaultsource/improving-care/better-mh-policy/college-reports/college-report-cr164.pdf?sfvrsn=79416179_2[Accessed 15 Sep. 2019].

Help Seeking Behaviours and Perceptions of Stigma in Depressed Medical Students

Kathryn Young, Dr Rory Barr

University of Edinburgh

INTRODUCTION: The prevalence of mental health issues in medical students is high1. Low rates of appropriate help seeking have been observed in this group1,2. Among the potential barriers to help seeking, stigma has been identified as a key area2,3. The aim of this study was to assess mental health stigma in depressed and non-depressed medical students and to evaluate help seeking behaviours.

PATIENTS AND METHODS: All students at a Scottish Medical School were invited to participate in a cross-sectional online survey (Feb-April 2019). The survey included a validated, self-reported depression questionnaire (PHQ-9)4 and items about stigma and help seeking. Students indicated the degree to which they agreed or disagreed with thirteen 'stigma statements' on a Likert scale. Validated PHQ-9 cut-off scores were used for no/minimal depression, mild depression and moderate/severe depression. Groups were compared by chi-squared tests.

RESULTS: The response rate was 16.6% (215); 100 students were classified as non/minimally, 58 as mildly and 57 as moderately-severely depressed. Twenty eight (24.3%) of the depressed students had an existing mental health diagnosis. Forty two (36.5%) of the depressed students sought professional help. The moderate-severe depression group more frequently give stigmatising responses to 10 of 13 stigma statements and were significantly less likely than the other groups to agree that they would seek professional help for an emotional/mental health issue ($P<0.05$). The majority (125, 71.1%) of students indicated that they had witnessed other medical students displaying stigmatising behaviour at least once in the previous 12 months. Sixty (27.9%) students indicated that they had witnessed staff members displaying stigmatising behaviours at least once in the previous 12 months.

CONCLUSIONS: In this small survey, 53.5% of respondents met PHQ-9 criteria for depression. A minority of these students showed appropriate help seeking behaviour. Depressed students more frequently endorsed stigma about mental health, this may be a barrier to help seeking. The study is limited by sample size and risk of sampling bias. Therefore, further research on a larger scale is necessary to fully investigate this issue.

REFERENCES:

1. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: A Systematic Review and Meta-Analysis. *JAMA* 2016;316:2214-36
2. Givens JL, Tjia J. Depressed Medical Students' Use of Mental Health Services and Barriers

to Use. *Acad Med* 2002; 77(9):918–921.
3. Chew-Graham CA, Roger A, Yassin N. 'I wouldn't want it on my CV or their records': medical students' experiences of help-seeking for mental health problems. *Med Educ* 2003;37(10):873-80.
4. Cannon DS, Tiffany ST, Coon H, Scholand MB, McMahon WM, Leppert MF. The PHQ-9 as a brief assessment of lifetime major depression. *Psychol Assess* 2007;19(2):247-51

Improving Patient Experience in the Acute Medical Setting

Olivia Yu, Dr Claire Gordon

Edinburgh Medical School

INTRODUCTION: The Health and Social Care Standards are underpinned by five principles, of which, to "be included" is the key to success in all health and social care provision (1). Yet reports suggest patients admitted acutely are often offered insufficient support in the healthcare environments (2). The lack of understanding of the acute medical admission and the prospect of prolonged hospital stay heightens patients' feelings of anxiety and vulnerability. Empowering patients with knowledge of non-clinical aspects of their care not only alleviates feelings of uncertainty, it also reduces occurrence of interruptions experienced by staff which can lead to task inefficiency and increased clinical error severity (3). This is a quality improvement project whereby we investigated the existing efforts to inform and guide patients through their initial acute medical care process at the Medical Assessment Unit (MAU) at Western General Hospital, Edinburgh, and evaluated the information needs of patients to produce a suitable patient welcome leaflet.

PATIENTS AND METHODS: Information resources provided to MAU patients were identified and evaluated against different criteria, including format, design, information provided, and availability. A questionnaire (n=101) was distributed to patients admitted to MAU to determine the amount/type of information they received, and information that they found most relevant and important to them. The data was analysed and used in the design of a new patient welcome leaflet which was trialled in the MAU. Feedback survey (n=51) was given out to patients to explore whether information provided in the patient welcome leaflet can effectively help patients be better informed about their stay.

RESULTS: At the MAU, four information resources were identified for acute admissions, though only one of these resources were readily available when patients are admitted and the others were only given out upon patients' request. No correlation has been found between information given to MAU patients and their perceived importance ($p>0.05$) in the pre-implementation questionnaire. Overall, 94% of patients found the patient welcome leaflet helpful and 84% felt better informed about their hospital stay.

CONCLUSIONS: Results from this study have been very positive in favour of a patient welcome leaflet for those admitted to the MAU. The hospital experience of patients admitted acutely can be improved by ensuring there are high-quality resources which are consistently available, providing patients with sufficient information about their stay. Going forward, it may also be beneficial to analyse the information needs of different age groups and adapt the resources accordingly. There is also further scope to develop a separate resource which addresses the needs of relatives and other visitors.

REFERENCES:
1. The Scottish Government. Health and Social Care Standards: My support, my life. Edinburgh; 2017.

2. Design Council. Reducing violence and aggression in A&E: through a better experience [Internet]. 2013. Available from: https://www.designcouncil.org.uk/sites/default/files/asset/document/AE_FE_evaluation_report.pdf
3. Westbrook JI, Woods A, Rob MI, Dunsmuir WTM, Day RO. Association of Interruptions With an Increased Risk and Severity of Medication Administration Errors. Arch Intern Med. 2010;170(8):683–690. doi:10.1001/archinternmed.2010.65

The Practical Efficacy of Intra-Abdominal Peritoneal Fluid Sampling: A Case for Revival

Delaram Mostowfi Zadeh

Barts and the London School of Medicine

INTRODUCTION: Appendicitis is the most common global surgical emergency and left untreated can lead to perforation, resulting in irritating fluid from the appendix leaking into the abdominal cavity or peritoneum. Intra-peritoneal fluid sampling for microbial culture has been a long-standing practice. Identification of the bacteria implicated in appendicitis was previously used to guide selective post-operative antibiotic therapy. However, over recent decades, empirical broad-spectrum antibiotic therapy has been favoured for pre- and post- operative use. In light of this, many surgeons advocate the abandonment of intraperitoneal fluid sampling, as regardless of results, it is not generally used to alter the course of antibiotic therapy in patients. However, can we justify continuing to give the incorrect antibiotics to a patient with a demonstrably resistant infection and what are the associated ethical and legal liabilities in choosing to ignore readily available microbiological data? With the increased incidence of antimicrobial resistance, is it perhaps medically irresponsible to abandon guided antibiotic prescription?

PATIENTS AND METHODS: A literature search of PubMed on articles published in English from January 1998 to December 2018 using the key words: appendicectomy, appendectomy, intra-abdominal culture, pus sampling, peritoneal sampling/ swab/culture, microbiological pus sampling, intra-peritoneal fluid culture/sampling was performed. Additional cross-referencing was performed manually on other associated publications.

RESULTS: Literature search revealed the following results: Pathogens are predictable and sensitive to broad spectrum antibiotics; Low positive culture rates; Patients are discharged before microbiological data becomes available; No difference in morbidity rate in patients with peritoneal sampling containing resistant vs. sensitive bacteria; Culture data is ignored in clinical decision making affecting no change in post-operative management.

CONCLUSIONS: Research in favour of abandonment of intraperitoneal sampling so far have all been nonrandomised retrospective studies privy to statistical error with some citing sample sizes as low as 35. No author thus far has considered the ethical and legal obligations to act upon data beneficial to patient outcome. Crude calculations show that post-operative infective complications increase median hospital stay by at least 2 days showing a cost-benefit incentive to continue the practice. Responsible, evidence-based prescribing impedes the global surge in antimicrobial resistance. Peritoneal fluid sampling is a scientifically sound practice and should be continued.

REFERENCES:
Ferris M, Quan S, Kaplan BS, Molodecky N, Ball CG, Chernoff GW, et al. The Global Incidence of Appendicitis: A Systematic Review of Population-based Studies. Annals of Surgery. 2017 Aug;266(2):237; Gladman, Marc & H Knowles, Charles & J Gladman, Lucy & G Payne, John. (2004).

Intra-operative culture in appendicitis: Traditional practice challenged. Annals of the Royal College of Surgeons of England 86. 196-201; Davies HOB, Alkhamesi NA, Dawson PM. Peritoneal fluid culture in appendicitis: Review in changing times. International Journal of Surgery. 2010;8:426–9. Mowad R, Dasmohapatra S, Justin T, Keeling N. Value of Intraoperative Abdominal Cavity Culture in Appendicectomy: A Retrospective Study. International Journal of Clinical Practice. 2006 Dec;60(12):1588–90.

Assessing Mortality Risk in Patients with Advanced Renal Disease using Feature Tracking Cardiac MRI

Luke Y. Zhu, Kenneth Mangion, Elaine Rutherford, Keith Gillis, Jennifer S. Lees, Rajan Patel, Giles Roditi, Patrick B. Mark, Alastair J. Rankin

University of Glasgow

INTRODUCTION: Myocardial fibrosis predicts patient mortality in advanced renal disease. Cardiovascular magnetic resonance (CMR) imaging with gadolinium enhancement defines myocardial fibrosis but is contraindicated in haemodialysis patients due to the risk of nephrogenic systemic fibrosis. Global Longitudinal Strain (GLS) by Feature Tracking-CMR (FT-CMR) is a non-contrast MRI technique that been shown to be a sensitive predictor of clinical outcomes. We assess the utility of GLS to predict all-cause mortality (ACM) in patients with severe CKD.

PATIENTS AND METHODS: We conducted a retrospective analysis of CMRs undertaken at a major renal transplant centre between 2002 and 2016. CMR parameters including left atrial ejection fraction (LAEF), left ventricular ejection fraction (LVEF), LV mass index (LVMI), and LV strain were derived in accordance to Society of CMR guidelines. Cox Proportional Hazards analysis was used to build our mortality model. Model goodness-of-fit was assessed using the Cstatistic.

RESULTS: Among 237 patients (mean age: 53.7, 61% male), mortality was 50.6% over 4.6-year median follow-up. The mean LVEF was (mean±standard deviation): 63.56±10.22%. On multivariate Cox regression, we found age (Hazard Ratio (HR): 1.04, 95%CI:1.02-1.06, p<0.001), LAEF (HR: 0.98, 95%CI:0.96-0.997, p=0.019) and LVGLS (HR: 1.076, 95%CI:1.01- 1.14, p=0.021) to be independent predictors of mortality. The C-statistic for predicting ACM at 1-year was 0.955 (95% CI: 0.920-0.991), and at 3-years: 0.870 (95% CI: 0.808-0.932), demonstrating excellent predictive potential.

CONCLUSIONS: In this cohort of patients with advanced renal failure, LVGLS and LAEF measured on FTCMR demonstrate independent predictive effects on mortality, whilst conventional imaging biomarkers such as LVEF and LVMI did not. We believe FT-CMR lies at the intersection of accuracy and ease of acquisition, and have demonstrated its utility in this cohort. Future studies are required to assess its potential as a measure of pre-transplant cardiovascular risk, and as a surrogate outcome measure in future studies looking to reduce cardiovascular risk in patients with ESRD.

Postgraduate Prizes

Best Postgraduate Oral

Association Between Depression and Dementia in Older Adults with Type 2 Diabetes

Alistair Carr, Anniek Sluiman, Sheila Grecian, Rachel Forster, Stela McLachlan, Mark Strachan, Jackie Price

University of Edinburgh/Usher Institute

INTRODUCTION: The prevalence of depression in people with type 2 diabetes is around twice that of the general population (1). Both these diseases are independent risk factors for dementia and when they co-exist the risk of dementia is higher than the sum of each individually (1). Factors related to the severity of type 2 diabetes or cardiovascular disease may mediate this relationship (1). The increasing prevalence of both type 2 diabetes and depression makes understanding the relationship between these diseases and their association with dementia an important area of public health research. This may reveal new targets for therapeutic interventions and inform strategies to identify people at highest risk. Our aim was to determine whether a prospective association exists between comorbid depression and type 2 diabetes with dementia and explore the effect of potentially mediating factors.

PATIENTS AND METHODS: The Edinburgh Type 2 Diabetes Study is a prospective cohort study that was established in 2006. It consists of 1,066 participants living in Lothian that were aged 60-75 years at time of recruitment and had type 2 diabetes. At study baseline a range of clinical and demographic data were collected including assessment of cognitive status and completion of the Hospital and Anxiety Depression Scale (HADS). Depression was defined by HADS score ≥ 8. Incident dementia from study baseline to year-10 of follow-up was determined by analysing electronic hospital records, hospital discharge codes, dementia medication prescription data and death records. Binary logistic regression analyses were undertaken to explore the association between depression and incident dementia. The fully adjusted model adjusted for age, sex, marital status, education, employment, socio-economic deprivation, BMI, smoking status, hypertension, dyslipidaemia, macrovascular disease, diabetic retinopathy, diabetes duration, diabetes treatment and HbA1c.

RESULTS: Prevalence of depression was 11.8% (n=126) at study baseline. Study participants with depression were more likely to be female, single or widowed, be current smokers, have higher BMI, have greater prevalence of macrovascular disease and manage their diabetes with insulin. Incident dementia was diagnosed in 9.9% (n=106) of study participants. Logistic regression analysis showed a strong unadjusted association between depression and incident dementia (OR 2.15, 95%CI: 1.27-3.54, p=0.003). There was no major change in the strength of association after adjusting for age and sex (OR 2.43, 95%CI: 1.41-4.04, p=0.001) or after full adjustment (OR 2.85, 95%CI: 1.57-5.06, p<0.001).

CONCLUSIONS: This study confirms that depression is a major risk factor for dementia in people with type 2 diabetes. It showed that this association persists after adjusting for a wide range of important covariates. Further work is required to determine the biological pathways that mediate this relationship. This study also indicates that the self-completed HADS questionnaire could be a useful tool in screening for high risk patients.

REFERENCES:
(1) Katon W, Pedersen HS, Ribe AR, Fenger-Grøn M, Davydow D, Waldorff FB, et al. Effect of Depression and Diabetes Mellitus on the Risk for Dementia: A National Population-Based Cohort StudyEffect of Depression and Diabetes Mellitus on Dementia RiskEffect of Depression and Diabetes Mellitus on Dementia Risk. JAMA Psychiatry. 2015;72(6):612-9.

Best Postgraduate Oral

Hip displacement and dislocation in a total population of children with cerebral palsy in Scotland: status after five years' hip surveillance

SJ Wordie, JE Robb, G Hägglund, KE Bugler, MS Gaston

NHS Lothian/NHS Fife

INTRODUCTION: Hip displacement is a common clinical presentation in children with cerebral palsy (CP). It is widely recognised that the risk of hip displacement is directly related to the Gross Motor Function Classification System (GMFCS) level, with the incidence increasing with GMFCS levels.1,2 Hip surveillance was introduced in Sweden3 in the CPUP surveillance programme over 20 years ago and after its introduction the prevalence of hip dislocation fell from about 8% to 0.5%. This purpose of this study is to compare the prevalence of hip displacement and dislocation in a total population of children with cerebral palsy (CP) in Scotland before and after the initiation of a hip surveillance programme. And to report on the surgical procedures undertaken for hip displacement and dislocation in children during that time

PATIENTS: Patients: 95% of children with cerebral palsy are registered in the Cerebral Palsy Integrated Pathway Scotland (CPIPS) surveillance programme, which began in 2013. Physical examination and hip radiographic data are collected according to nationally agreed protocols.

METHODS: Age, Gross Motor Function Classification System (GMFCS) level, CP subtype, Migration Percentage (MP) and details of hip surgery were analysed in all children aged 2-16 years taken from a census date in March 2019 and compared to the same data from the initial registration of children in CPIPS. Hip displacement was defined as a MP 40-99% and hip dislocation as a MP = 100%.

RESULTS: 1633 children were available for analysis on the census date and 1171 children at their first registration in CPIPS. The distribution of age, sex and GMFCS levels were similar between the two groups. The prevalence of hip displacement and dislocation before surveillance began were 10% and 2.5% respectively and at the census date 4.5% and 0.5% respectively. Hip dislocation was only seen in levels IV and V and displacement seen in 90.5% of these levels and 9.5% in levels I-III. 138 children had undergone hip surgery over the study period. Fifteen children developed a re-displaced hip after the initial surgery. Seven of these children had undergone a second procedure and at the census date the hips in all seven had a MP <40.

CONCLUSIONS: Hip surveillance appears to be effective and has more than halved the prevalence of hip displacement and dislocation in this population.

REFERENCES:
1 Soo B, Howard JJ, Boyd RN, Reid SM, Lanigan A, Wolfe R, et al. Hip displacement in cerebral palsy. J Bone Joint Surg Am. 2006;88(1):121-9.
2 Larnert P, Risto O, Hägglund G, Wagner P. Hip displacement in relation to age and gross motor function in children with cerebral palsy. J Child Orthop. 2014; 8:129-34.

3 Hägglund G, Alriksson Schmidt A, Lauge Pedersen H, et al. Prevention of hip dislocation in children with cerebral palsy: 20-year results of a population based prevention programme. Bone Joint J. 2014;96-B:1546-52.

Best Postgraduate Poster

The detection of lymphatic invasion in colorectal polyp cancer by D2-40 immunohistochemistry and its association with prognosis

Mohammad Goodarzi, David Mansouri, Andrew Kidd, Clare Orange, Fraser Duthie

Glasgow Royal Infirmary

INTRODUCTION: Immunohistochemistry with D2-40 allows specific staining of the endothelium of lymphatic vessels and can improve the detection of lymphatic invasion in primary solid cancers. The aim of this study was to compare the detection of lymphatic invasion using H&E staining or D2-40 immunostaining on specimens from a retrospective cohort of patients with colorectal polyp cancer. The association of lymphatic invasion, detected by either method, with survival was also determined.

PATIENTS AND METHODS: Patients with pathologically diagnosed colorectal cancer were selected from the Greater Glasgow & Clyde Bowel Cancer Screening Registry between April 2009 to March 2011. Specimens from these patients were used for D2-40 immunohistochemistry staining. Clinicopathological information was retrieved from patient electronic records including whether lymphatic invasion was detected on initial diagnostic pathology reports. These reports were used to represent H&E staining – allowing direct comparison with clinical practice.

RESULTS: 170 polypectomy specimens from 100 patients were included within this study. The median age at polypectomy was 66 years (range 50-76). All patients were followed up for a minimum of 4 years and 5 out of 100 patients died due to colorectal cancer. Lymphatic invasion was detected in 8% of cases by H&E staining and 23% of cases with D2-40 immunostaining. No clinical or pathological variables other than D2-40 detected lymphatic invasion showed a statistically significant relationship with colorectal cancer specific mortality after 4 years using univariate analysis (p=0.01). Survival analysis performed separately by Cox regression demonstrated that lymphatic invasion detected by D2-40 immunostaining was associated with worse disease-specific survival (hazard ratio [HR] 14.07, 95% CI 1.57-125.97, p=0.018).

CONCLUSIONS: The findings of this study show that D2-40 immunostaining can improve the detection of lymphatic invasion in colorectal polyp cancer when compared to routine clinical H&E staining. In addition, the lymphatic invasion detected by D2-40 immunostaining significantly associates with survival allowing it to be used as a prognostic indicator in colorectal polyp cancer.

Commended Postgraduate Poster

A step forward: improving the use of treatment escalation plans in a district general hospital

Christopher Wei En Chan, Wai Sun Lam, Paula Riley, David Christie

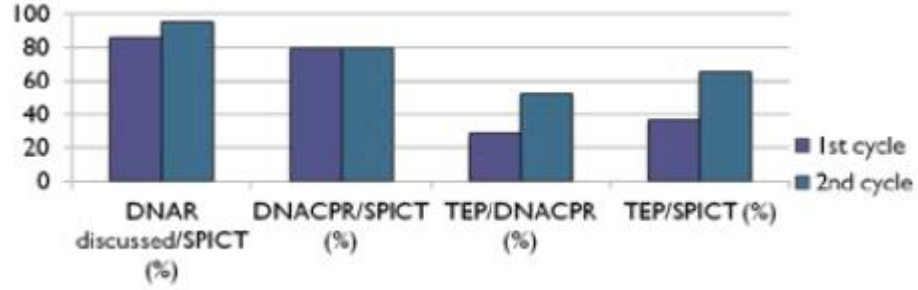
University of Glasgow

INTRODUCTION: While reviewing unwell patients, junior doctors noted that deteriorating patients with significant comorbidity did not have a clearly documented ceiling of care. In Dumfries and Galloway Royal Infirmary(DGRI), Treatment Escalation Plan(TEP) forms exist but often aren't given consideration. Implementation of TEPs is linked to reduced harm at end of life5, improved ease of decision making out of hours1, reduction of CPR related complaints4 and better practice of realistic medicine- all desirable outcomes.

PATIENTS AND METHODS: A snapshot was taken of every patient's notes in the medical wards on 29/11/18 . We used the Supportive and Palliative Care Indicators Tool(SPICT)2 to identify patients with significant comorbidity. These patient's notes were then checked for a DNAR and TEP. Clinical staff were engaged via presentations, meetings, emails and informal conversations with the initial results and the importance of consideration of ceiling of care.3 Data collection was then repeated again 6 months later, and results presented to the hospital.

RESULTS: As a proportion of SPICT patients, the DNAR completion was impressive at 90.8%. However, the TEP completion rate as a proportion of SPICT patients was only 35.4%. TEP completion varied by ward. We informally noted that locums were often the ones filling out the forms. TEP completion rates across the hospital improved to 52.3% by the time of the 2nd snapshot. We informally noted that more DGRI clinicians were considering TEPs.

Graphical representation of both snapshots



CONCLUSIONS: Following engagement, clinicians have shown greater awareness of the need for TEPs and discussing the ceiling of care in patients with severe comorbidity. We are working to further develop and improve the TEP process in line with national initiatives, and repeat further cycles. The use of a clinical tool like SPICT can help identify patients with severe comorobidity and poor prognosis.

REFERENCES:

1. Obolensky L, Clark T, Matthew G, et al. A patient and relative centred evaluation of treatment escalation plans: a replacement for the do-not-resuscitate process. J Med Ethics 2010;36:518–20.doi:10.1136/jme.2009.033977
2. SPICT-4ALL™ [Internet]. SPICT. 2019 [cited 7 January 2019]. Available from: https://www.spict.org.uk/the-spict/spict-4all/
3. Fadel MG, Parekh K, Hayden P, et al Improving resuscitation decisions: a trust-wide initiative BMJ Open Qual 2018;7:e000268. doi: 10.1136/bmjoq-2017-000268
4. Shermon E, Munglani L, Oram S, et al Reducing DNACPR complaints to zero: designing and implementing a treatment escalation plan using quality improvement methodology BMJ Open Qual 2017;6:e000011. doi: 10.1136/bmjoq-2017-000011
5. Lightbody, C., Campbell, J., Herbison, G., Osborne, H., Radley, A. and Taylor, D. (2018). Impact of a treatment escalation/limitation plan on non-beneficial interventions and harms in patients during their last admission before in-hospital death, using the Structured Judgment Review Method. BMJ Open, 8(10), p.e024264.

Postgraduate Abstracts

The Infectious Basis of Alzheimer's Disease – A Systematic Review

Mohammad Abdullah, Elaine Bignell

Manchester Medical School

INTRODUCTION: Alzheimer's disease is the leading cause of dementia worldwide, and its prevalence is increasing. Several theories, most significantly the amyloid beta and tau protein hypotheses, offer credible explanations for the pathology of Alzheimer's disease. Research for an infectious cause of the disease has steadily accumulated over years. The aim of this research was to perform a systematic review of preclinical studies of infection-related AD to: a) seek associations between infection and AD, and b) identify best-practice for experimental pre-clinical analysis to further study links between infection and AD.

PATIENTS AND METHODS: The PubMed and SCOPUS databases were searched for studies published since the year 2000 which report in vivo animal or in vitro cell-based models of infection-related AD. The papers identified were exclusively on infectious organisms and included studies on herpes simplex 1 virus, human immunodeficiency virus, Chlamydia pneumoniae, Helicobacter pylori, and Candida albicans.

RESULTS: Initial scoping searches yielded a total of 1100 publications. More targeted searches in the names databases narrowed the paper count to 68. More strict inclusion criteria were introduced to identify more recent and relevant papers, and the number was reduced to a cohort of (n=24) studies conforming to the defined inclusion criteria. Overall, 24 papers were identified to be the most suitable for discussion in the systematic review.

CONCLUSIONS: The literature on infections and AD is very limited, with variable non-standardised study designs and outcomes available. The most extensively studied organisms are HSV1 and C. pneumoniae, with no definitive correlation between them and AD. All studied organisms thus far do not satisfy Koch's postulates for confirmation of the infectious aetiology of diseases. It remains to be seen whether infections can cause AD, are confounding adjuncts to the disease, or whether AD predisposes patients to infection and colonisation by certain organisms. More preclinical studies need to be performed, based on pre-existing well-designed studies, to bridge the gap on the topic and provide better understanding. A good experimental model advised based on the outcome of this review would be to use repeated low-dose infection in non-transgenic mice over months with follow-up over 16-18 months, followed by the use of immunohistochemistry to detect any AD changes, and comparing those results to a control group of mice over the same period.

REFERENCES:

1. Blennow K, de Leon MJ, Zetterberg H. Alzheimer's disease. The Lancet. 2006 368(9533):387-403.
2.Itzhaki RF, Lathe R, Balin BJ, Ball MJ, Bearer EL, Braak H, et al. Microbes and Alzheimer's Disease. J Alzheimers Dis. 2016;51(4):979-84.
3. Dobson CB, Wozniak MA, Itzhaki RF. Do infectious agents play a role in dementia? Trends Microbiol. 2003;11(7):312-7.
4. Balin BJ, Little CS, Hammond CJ, Appelt DM, Whittum-Hudson JA, Gerard HC, et al. Chlamydophila pneumoniae and the etiology of late-onset Alzheimer's disease. J Alzheimers Dis. 2008;13(4):371-80.
5. Alonso R, Pisa D, Marina AI, Morato E, Rabano A, Carrasco L. Fungal infection in patients with Alzheimer's disease. J Alzheimers Dis. 2014;41(1):301-11.

6. Binek M. A glance at Koch's postulates 100 years after his death. Postepy Mikrobiologii. 2010;49(3):157-64.

Clinician Understanding of the spectrum of agreement, capacity and consent

Dr Motaz MS Abulaila, Professor Samuel P Dearman,

North Cumbria Integrated Care NHS Foundation Trust

INTRODUCTION: Crisis and home treatment teams (HTT) represent an alternative to hospital based care for patients with risks to themselves or others. Regardless of whether these patients are treated at home or in hospital, care must take into account the same legal rights1 and associated good practice2. This means that the same considerations around capacity3,4, agreement and consent5 should be expected. However, the services treating patients at home do not have the same immediate access to the processes and frameworks to address these challenges that hospitals do, this leads to a risk that HTT staff may have a deficit in related knowledge and skills.

PATIENTS AND METHODS: We designed and piloted a bespoke 60 minute evaluation and educational intervention to assess and improve knowledge and skills in managing both the legal and linguistic challenges in terms of assent, agreement, capacity and consent. The intervention used knowledge-based materials and facilitated case vignettes to practice and consolidate skills. The participants where a range of multi-professionals within a HTT whom completed a pre and post self-appraisal using Likert scales. Analysis considered the change in self-assessed knowledge and skills.

RESULTS: The pilot was completed by 13 practitioners including doctors, nurses, occupational therapists and police of varying seniority. 100% of participants agreed that they confidently understand the difference between assent and consent after the intervention compared to 23% beforehand. Similarly, in terms of understanding the relationship between agreement and assent, 84.6% agreed that they better understood, as compared to 23% prior to the session. In respect to understanding the relationship between agreement and informed consent this also improved from 77% to 100%. 100% of participants agreed that this is an important topic for staff development within HTT.

CONCLUSIONS: The piloted educational intervention, which contains core knowledge and case discussion appears to represent an effective, simple and brief approach for increasing staff knowledge and skills as to capacity and consent and as such warrants further study.

REFERENCES:
[1] Mental Capacity Act 2005.
http://www.legislation.gov.uk/ukpga/2005/9/pdfs/ukpga_20050009_en.pdf
[2] General Medical Council (Gran Bretanya). (2008). Consent: patients and doctors making decisions together. General Medical Council.
[3] Sessums, L. L., Zembrzuska, H., & Jackson, J. L. (2011). Does this patient have medical decision-making capacity?. Jama, 306(4), 420-427
[4] Voskou, P., Douzenis, A., Economou, A., & Papageorgiou, S. G. (2018). Testamentary capacity assessment: legal, medical, and neuropsychological issues. Journal of geriatric psychiatry and neurology, 31(1), 3-12.
[5] Gillon R. (1985). Consent. British medical journal (Clinical research ed.), 291(6510), 1700–1701. doi:10.1136/bmj.291.6510.1700

Liquid nitrogen freeze-clamping Glioblastoma samples for metabolomic analysis: a feasibility study

Sean Rong-Wen Beh, Jyotsna Rao, Richard Mair

University of Aberdeen, University of Cambridge

INTRODUCTION: Glioblastomas (GBs) are highly aggressive brain tumours which confer a median 15-month survival due to their infiltrative and heterogenous nature. The understanding of the differing metabolisms via determining the ATP/ADP ratios within GBs may hold the key to improving patient outcomes. In order to undertake NMR metabolomic analysis, a method of fixing GB samples from patients must be validated. Liquid nitrogen (LN2) freeze clamping has been previous utilised in rat models, but it has not been verified on human GB samples obtained intra-operatively. This study was designed to determine the suitability of flash freezing of glioblastoma samples for metabolomic analysis using ATP/ADP ratio as a surrogate marker.

PATIENTS AND METHODS: GBs biopsied intraoperatively were rapidly fixed in LN2, prepared for 31P nuclear magnetic resonance (NMR) spectroscopy and spectra were obtained. The relative phosphate peaks were identified via comparisons with previous rat studies and the ratio of ATP/ADP of each sample was determined.

RESULTS: Good results were obtained from two samples, while two of the other samples produced spectra with no identifiable ATP or ADP peaks.

CONCLUSIONS: LN2 freeze clamping is a suitable method of preserving GB samples for metabolomic analysis, however various principles must be adhered to in order to produce useful spectra.

REFERENCES:

1. Greenberg D, Winters T, Brodbelt A, Williams M, Vernon S, Flowers J et al. Incidence and outcomes for cerebral Glioblastoma in England. [Internet]. London: Public Health England; 2012. Available from: http://www.ncin.org.uk/view?rid=2662
2. Ohgaki H, Kleihues P. The Definition of Primary and Secondary Glioblastoma. Clinical Cancer Research. 2012;19(4):764-772.
3. Kumar V, Abbas A, Aster J. Robbins and Cotran Pathologic Basis of Disease. Philadelphia, PA: Elsevier Saunders; 2015.
4. Cohen A, Holmen S, Colman H. IDH1 and IDH2 Mutations in Gliomas. Current Neurology and Neuroscience Reports. 2013;13(5).
5. Reuss D, Mamatjan Y, Schrimpf D, Capper D, Hovestadt V, Kratz A et al. IDH mutant diffuse and anaplastic astrocytomas have similar age at presentation and little difference in survival: a grading problem for WHO. Acta Neuropathologica. 2015;129(6):867-873.
6. Eckel-Passow J, Lachance D, Molinaro A, Walsh K, Decker P, Sicotte H et al. Glioma Groups Based on 1p/19q, IDH, and TERT Promoter Mutations in Tumors. New England Journal of Medicine. 2015;372(26):2499-2508.
7. Chang S. Patterns of Care for Adults With Newly Diagnosed Malignant Glioma. JAMA. 2005;293(5):557.
8. Trifiletti D, Alonso C, Grover S, Fadul C, Sheehan J, Showalter T. Prognostic Implications of Extent of Resection in Glioblastoma: Analysis from a Large Database. World Neurosurgery. 2017;103:330-340.
9. Brandes A, Tosoni A, Franceschi E, Sotti G, Frezza G, Amistà P et al. Recurrence Pattern After Temozolomide Concomitant With and Adjuvant to Radiotherapy in Newly Diagnosed Patients With Glioblastoma: Correlation WithMGMTPromoter Methylation Status. Journal of Clinical Oncology. 2009;27(8):1275-1279.

10. Soeda A, Hara A, Kunisada T, Yoshimura S, Iwama T, Park D. The Evidence of Glioblastoma Heterogeneity. Scientific Reports. 2015;5(1).
11. Ferrara N, Hillan K, Gerber H, Novotny W. Discovery and development of bevacizumab, an anti-VEGF antibody for treating cancer. Nature Reviews Drug Discovery. 2004;3(5):391-400.
12. Ellis L, Reardon D. The nuances of therapy. Nature. 2009;458(7236):291-292.
13. Puchalski R, Shah N, Miller J, Dalley R, Nomura S, Yoon J et al. An anatomic transcriptional atlas of human glioblastoma. Science. 2018;360(6389):660-663.
14. Berg J, Tymoczko J, Stryer L. Biochemistry. New York: W.H. Freeman and Co.; 2002.
15. Strickland M, Stoll E. Metabolic Reprogramming in Glioma. Frontiers in Cell and Developmental Biology. 2017;5.
16. Agnihotri S, Zadeh G. Metabolic reprogramming in glioblastoma: the influence of cancer metabolism on epigenetics and unanswered questions. Neuro-Oncology. 2015;18(2):160-172.
17. [Internet]. Upload.wikimedia.org. 2018 [cited 23 December 2018]. Available from: https://upload.wikimedia.org/wikipedia/commons/d/d5/LDH_activity-_normal_vs_canceous_cells.png
18. Vander Heiden M, Cantley L, Thompson C. Understanding the Warburg Effect: The Metabolic Requirements of Cell Proliferation. Science. 2009;324(5930):1029-1033
19. Vlashi E, Lagadec C, Vergnes L, Matsutani T, Masui K, Poulou M et al. Metabolic state of glioma stem cells and nontumorigenic cells. Proceedings of the National Academy of Sciences. 2011;108(38):16062-16067.
20. Janiszewska M, Suva ML, Riggi N, et al. Imp2 controls oxidative phosphorylation and is crucial for preserving glioblastoma cancer stem cells. Genes Dev. 2012;26(17):1926–1944.
21. Vartanian A, Singh S, Agnihotri S, Jalali S, Burrell K, Aldape K et al. GBM's multifaceted landscape: highlighting regional and microenvironmental heterogeneity. Neuro-Oncology. 2014;16(9):1167-1175.
22. Muller FL, Colla S, Aquilanti E, et al. Passenger deletions generate therapeutic vulnerabilities in cancer. Nature. 2012;488(7411):337–342
23. Maldonado E, Lemasters J. ATP/ADP ratio, the missed connection between mitochondria and the Warburg effect. Mitochondrion. 2014;19:78-84.
24. Cells Studied By NMR, Fátima Cruz, Sebastián Cerdán, in Encyclopedia of Spectroscopy and Spectrometry, 1999
25. Cadoux-Hudson T, Blackledge M, Rajagopalan B, Taylor D, Radda G. Human primary brain tumour metabolism in vivo: a phosphorus magnetic resonance spectroscopy study. British Journal of Cancer. 1989;60(3):430-436.
26. Chance B, Nakase Y, Bond M, Leigh J, McDonald G. Detection of 31P nuclear magnetic resonance signals in brain by in vivo and freeze-trapped assays. Proceedings of the National Academy of Sciences. 1978;75(10):4925-4929.
27. Cunningham M, Doran M. Freezing Biological Samples [Internet]. Leica Biosystems. 2018 [cited 25 December 2018]. Available from: https://www.leicabiosystems.com/pathologyleaders/freezing-biological-samples
28. Reid N, Beesley J. Sectioning and cryosectioning for electron microscopy. Amsterdam: Elsevier; 1991.
29. Boulton A, Baker G, Butterworth R. Carbohydrates and Energy Metabolism. Totowa, NJ: Humana Press; 1989.
30. Rodrigues-Silva E, Siqueira-Santos E, Ruas J, Ignarro R, Figueira T, Rogério F et al. Evaluation of mitochondrial respiratory function in highly glycolytic glioma cells reveals low ADP phosphorylation in relation to oxidative capacity. Journal of Neuro-Oncology. 2017;133(3):519-529.
31. Ha D, Choi S, Oh J, Yoon S, Kang M, Kim K. Application of31P MR Spectroscopy to the Brain Tumors. Korean Journal of Radiology. 2013;14(3):477.
32. Li Y, Park I, Nelson S. Imaging Tumor Metabolism Using In Vivo Magnetic Resonance Spectroscopy. The Cancer Journal. 2015;21(2):123-128.

Documentation of Resuscitation Status in a Busy District General Hospital

Jessica Bennett, Robyn Canham, Danielle Clyde

INTRODUCTION: Do Not Attempt Cardio-pulmonary Resuscitation (DNACPR) forms were introduced in the UK in 20091. This was based on the evidence that early documentation of resuscitation status can improve patient safety; reduce inappropriate referrals to critical care and aid communication between clinical teams involved in patient care2,3. Within NHS Fife, there has been a drive to reduce the number of cardiac arrest resuscitation calls. One strategy is ensuring that patients, for whom CPR would not be clinically appropriate, have DNACPR forms completed. Many patients admitted via surgical admissions unit did not have resuscitation status documented. This quality improvement project was developed to encourage wider documentation of resuscitation status within the department.

PATIENTS AND METHODS: All emergency surgical patients over the age of 17 were included in the week long audit in June 2019. The primary outcome was documented resuscitation status following initial consultant review. The results were presented at a departmental meeting leading to discussion of possible interventions. The decision was made to invite surgical nurse practitioners, reliably present on every ward round, to prompt consultants to complete a resuscitation status proforma for every patient. A re-audit, over a one week period, was then conducted following intervention in July 2019.

RESULTS: Initial data collection included 41 patients. Of these patients, 12% had resuscitation status documented (n=5); 7% were for CPR (n= 3) and 5% were DNACPR (n=2). Following intervention, 73 patients were reviewed. 42% of these patients had a resuscitation status documented (n=31);. Of these patients, 38% were for resuscitation (n=28) and 4% were DNACPR (n=3).

CONCLUSIONS: This project has highlighted how a simple intervention significantly increased documentation of resuscitation status within the department. However, a significant proportion of patients' resuscitation status remained undocumented. Further interventions, such as posters, departmental education with continual review through regular audit can ensure that DNACPR documentation remains a clinical priority.

REFERENCES:

1. Do Not Attempt CPR model forms [Internet]. Resus.org.uk. 2019 [cited 18 October 2019]. Available from: https://www.resus.org.uk/dnacpr/do-not-attempt-cpr-model-forms/
2. Mockford C, Fritz Z, George R, Court R, Grove A, Clarke B et al. Do not attempt cardiopulmonary resuscitation (DNACPR) orders: A systematic review of the barriers and facilitators of decision-making and implementation. Resuscitation. 2015;88:99-113.
3. Fadel M, Parekh K, Hayden P, Krishnan P. Improving resuscitation decisions: a trust-wide initiative. BMJ Open Quality. 2018;7(4):e000268.

Paediatric surgical clerk-in proforma

Ross Bogle, Callum Black

INTRODUCTION: Patients admitted under the care of the paediatric surgical specialties at the Royal Hospital for Children require clerk-in by a foundation doctor. The purpose of this is to conduct a complete assessment and examination of each patient. This ensures that any abnormal findings are identified and addressed prior to general anaesthesia and surgery.

Following discussion with foundation doctors and more senior medical staff, we identified ENT examination, social history and vaccination history as areas that could be improved upon.
This two-cycle snapshot clinical audit examines the completeness of the foundation doctor clerk-in and whether it covers some important aspects of history and examination; ear, nose and throat examination, social history and vaccination history.

PATIENTS AND METHODS:
Two data collection cycles were undertaken.
All patients who had received a foundation doctor clerk-in under the care of paediatric surgical specialties were included.
The first cycle was undertaken as a snapshot audit over the course of one day where all of the hospital inpatients that meet the inclusion criteria were recruited.
After this, a presentation was given to the department which published the results of the first cycle and introduced a new surgical clerk-in proforma.
Basic patient demographics were collected and data was collected on whether each identified aspect of the clerk in was covered in the clerk-in: ear examination, nose examination, throat examination, social history, immunisation history and in the second cycle; compliance with clerk-in proforma.
The data from the first and second cycle of the audit was then compared to examine for improvement in compliance with the identified aspects of the clerk in.

RESULTS: Cycle 1 recruited a total of 19 participants. Cycle 2 recruited a total of 20 participants.
In cycle 1, out of 19 participants; 0 ear examinations, 2 nose examinations and 3 throat examinations were done. 10 social histories and 14 immunisation histories were taken.
In cycle 2, the clerk-in proforma was used in 8 out of 20 clerk-ins. 8 ear examinations, 8 nose examinations and 17 throat examinations were done. 19 social histories and 18 immunisation histories were taken.

CONCLUSIONS: Foundation doctor clerk in's for paediatric surgical patients remain crucial as a documented complete assessment of each child. This audit identified areas of poor compliance and took practical steps which to change this. Re-audit has demonstrated significant improvement and further work should aim to better this.

Decreasing rates of nephrotoxic injury in the Surgical Observation Unit

Clementina Calabria, Jennifer Hendry, Alexander Thompson

INTRODUCTION: Acute kidney injury (AKI) affects up to 20% of hospital inpatients. Development of AKI is a multifactorial process with various risk factors including pre-existing renal failure, advanced age, acute illness, surgery and nephrotoxic medication. Post-operative AKI is associated with an increased risk of mortality and morbidity – including long-term development of chronic kidney disease. NICE guidelines recommend to consider temporarily withholding nephrotoxics during an acute illness and prior to elective and emergency surgery. As junior doctors admitting to the surgical observation unit (SOU), there is an opportunity to decrease risk of AKI development in our patients by withholding nephrotoxic medication on admission. Our current practice was audited and various interventions put in place to promote NICE recommendations prior to re-auditing.

PATIENTS AND METHODS: 171 patients were selected from those admitted to the SOU at the Royal Infirmary of Edinburgh over a 5 month period. Data from their notes was collected retrospectively upon discharge and stored anonymously. 3 interventions were put into place: a sticker applied to medication drug charts used by doctors clerking patients, an informal small-group teaching session

and a poster in the SOU department. 40 patient notes were audited across 3 weeks in May following the interventions.

RESULTS: In the control group 50% of patients were taking nephrotoxics on admission. Prior to the intervention 7% of nephrotoxics were withheld. 11% of patients were found to have an AKI during the admission and of these patients 63% were on nephrotoxic medication prior to admission. Following our intervention, we found that 40% of patients were on nephrotoxics and 63% of nephrotoxics were withheld on admission. 12.5% of patients were diagnosed with an AKI on admission and of these patients 100% of them were on nephrotoxic medication.
Across both groups we found that 95% of patients were found to have an AKI on admission and only 5% was found to develop an AKI whilst an inpatient.

CONCLUSIONS: Rates of AKI in patients admitted to the SOU are substantial and seem to occur prior to admission. Evidence shows that nephrotoxic medication predisposes these patients to developing an AKI and this is likely to occur prior to arriving to SOU secondary to an acute illness. Our interventions have significantly increased the number of nephrotoxics withheld on admission. Further data analysis is necessary to determine whether withholding nephrotoxics has an effect on reducing the duration or severity of AKI in these patients or decreasing rates of long-term kidney damage.

REFERENCES:
1. Kidney disease: improving global outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO clinical practice guideline for acute kidney injury. Kidney Inter Suppl. 2012;2:1-138. http://www.kdigo.org/clinical_practice_guidelines/pdf/KDIGO%20AKI%20Guideline.pdf
2. NICE (2013) Acute kidney injury. Prevention, detection and management of acute kidney injury up to the point of renal replacement therapy (NICE guideline). Clinical guideline 169. National Institute for Health and Care Excellence.

Physical Activity Survey In Patients with First Presentation of Myocardial Infarction

Hui Min Chen[1], Professor Dana Dawson[2]

1. Aberdeen Royal Infirmary, 2. University of Aberdeen

INTRODUCTION: The evidence about the health benefits of participating in regular exercise is well known. Regular physical activity is proven to reduce cardiovascular disease by up to 35%(1). The United State Department of Health and Human Services (HHS) has recently released the second edition of the Physical Activity Guidelines for Americans(2). The primary aim of this survey is to assess patient awareness and whether they are adherent to the consensus recommendation, in patients with first presentation of myocardial infarction.

PATIENTS AND METHODS: A structured questionnaire based on most recent guidelines (multiple-choice, closed-ended questions) was designed to collect data from patients who were newly admitted to Aberdeen Royal Infirmary, Cardiology with first presentation of myocardial infarction between February to April 2019. All the activities that met the intensity were added up to determine if a patient met the consensus recommendation.

RESULTS: Of the 50 patients, 78% were not aware of the exercise guideline and only 10% knew the right amount of physical activity that they should be engaging in. When leisure, work-related and household -related physical activity was summed up for each participant, only 40% met the

recommended guideline prior to admission. One-third of the cohort had awareness/insight into the need for increasing physical activity levels after a major cardiac event.

CONCLUSIONS: The current practice is not meeting the target of 100% recommended level of physical activities as outlined in the guideline. Therefore, a key area for improvement is to raise cardiovascular health awareness surrounding physical activities among our population.

REFERENCES:
1. Physical activity: applying All Our Health [Internet]. GOV.UK. 2018 [cited 13 May 2019]. Available from:https://www.gov.uk/government/publications/physical-activity-applying-all-our-health/physical-activity-applying-all-our-health
2. HHS. Physical Activity Guidelines for Americans 2nd edition [Internet]. [cited 2019 Jan 1]. Available from:https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf

Improving thromboprophylaxis prescribing in gynaecology using a venous thromboembolism risk assessment tool

Siobhan Chien

Royal Infirmary of Edinburgh

INTRODUCTION: Venous thromboembolism (VTE) is the leading cause of preventable death in hospital, with thromboprophylaxis shown to reduce VTE by 30-65% [1]. Gynaecological inpatients often have risk factors for VTE. VTE risk assessment and appropriate thromboprophylaxis prescription on admission is therefore imperative in this patient group. The SIGN guidelines support local policies to prescribe both pharmacological and mechanical thromboprophylaxis (unless contraindicated) [2]. This project used these local guidelines to determine if thromboprophylaxis prescribing in gynaecological inpatients at the Royal Infirmary of Edinburgh improved after implementing a VTE risk assessment tool.

PATIENTS AND METHODS: Clinical data related to VTE risk assessment and thromboprophylaxis prescription was collected from all gynaecological patients in Ward 210 at the Royal Infirmary of Edinburgh within a consecutive 5-day period. Data was analysed using the NHS Lothian Antithrombotic Guide Version 4.0 [4] to determine if thromboprophylaxis prescription was correct. A protocol for VTE risk assessment and thromboprophylaxis prescription was devised using local guidelines and implemented for 5 days before re-audit was performed. Data was collected from patients in Ward 210 during a further consecutive 5-day period. This was compared to the previous audit cycle to determine if implementation of the protocol resulted in an improvement in thromboprophylaxis prescription.

RESULTS: Thromboprophylaxis prescription was identified as correct in only 29.7% of gynaecological patients in the initial audit cycle, in accordance with local guidelines. Thromboprophylaxis prescribing was poorer in the elective surgery patients compared to the emergency admissions. After implementation of the protocol, thromboprophylaxis prescription improved by 28.8%, with 58.5% of patients prescribed the correct thromboprophylaxis. Thromboprophylaxis prescription improved by 57.3% in the elective patients after the risk assessment tool was implemented. There was no change in the emergency admissions. The most common prescribing error in both audit cycles was failure to prescribe mechanical thromboprophylaxis.

CONCLUSIONS: Use of the VTE risk assessment tool improved thromboprophylaxis prescribing by 28.8% within our department. There is scope to expand local guidelines by including a subsection for gynaecology inpatients to incorporate the difficult balance of VTE risk factors with bleeding risk in this cohort. Compliance with the protocol was variable, as patients were admitted from various clinical areas. This could be standardised by using pre-printed drug charts for thromboprophylaxis prescribing as seen in other NHS Scotland health boards. These interventions may reduce VTE-related morbidity and mortality.

REFERENCES:

1 Geerts WH, Bergqvist D, Pineo GF, Heit JA, Samama CM, Lassen MR, et al. Prevention of venous thromboembolism: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). Chest. 2008; 133 (6 Suppl): 381S-453S.
2 SIGN. Prevention and management of venous thromboembolism [Internet]. Edinburgh UK: SIGN; 2010 [updated 2014 October; cited 2019 March 05]. Available from: https://www.sign.ac.uk/assets/sign122.pdf
3 Anderson J. University Hospital Division Antithrombotic Guide (Adults) Version 4.0 [Intranet]. Edinburgh UK: NHS Lothian; 2018 [updated 2018 October; cited 2019 March 05]. Available from: http://intranet.lothian.scot.nhs.uk/Directory/Haematology/policy/Documents/Antithrombotic%20Guideline.pdf

A Rare Case of a Retroperitoneal Leiomyoma with Malignant Transformation

Sotonye Sandra Kenneth David-West, David Rae, Francis Inyang

Queen Elizabeth University Hospital

INTRODUCTION: Leiomyomas (fibroids) are benign tumours commonly found within the uterine cavity. However, leiomyomas found within the retroperitoneum are rare. The incidence of primary retroperitoneal leiomyomas is 0.5-1.2%1. The rarity of retroperitoneal leiomyomas often leads to diagnostic dilemmas as they can mimic malignancies2. The malignant transformation of a uterine fibroid is arguable and rarely occurs. We report a 38-year–old female who presented with a growing abdominal mass, increased urinary frequency and menorrhagia.

PATIENTS AND METHODS: Analysis of the patient's pre-operative abdominal ultrasonography, post-operative computed tomography and magnetic resonance imaging, immunohistochemical staining, macro and microscopic sectioning and a review of the literature provided the information required to produce this report.

RESULTS: Pre-operative ultrasonography identified a 20-week sized uterine mass however intra-operatively a large, multi-loculated retroperitoneal mass was attached to the posterior aspect of the uterus. Post-operative CT and MRI confirmed a large 18.1 x 20.0 x 22.3 cm residual retroperitoneal mass which was increasing in size. Pathology findings of the initial mass removed were consistent with a retroperitoneal leiomyoma: no obvious necrosis, immunohistochemical staining strongly positive for desmin, SMA and SMM and epithelial markers AE1/AE3 negative. However, the remaining retroperitoneal mass removed six months later showed scattered multinucleate cells, enlarged atypical cells and mitotic figures concluding these the appearances of that of a grade 1 leiomyosarcoma.

CONCLUSIONS: Retroperitoneal fibroids are rarely diagnosed pre-operatively even with ultrasonography, CT and MRI. It is important to diagnose a retroperitoneal tumour accurately so appropriate treatment can be initiated. Once a retroperitoneal leiomyoma is diagnosed, regular

monitoring and follow-up is required. Evidence of malignant transformation is poorly reported in the literature but must be considered particularly in fast growing tumours as leiomyosarcomas are aggressive tumours.

REFERENCES:

1. Funaki K, Fukunishi H, Tsuji Y, Maeda T and Takahashi T. Giant cystic leiomyoma of the uterus occupying the retroperitoneal space. Obstetric and Gynecologic Radioology. 2013; 7(12): 35-40.
2. Jeong G. Retroperitoneal leiomyoma of the uterus mimicking sarcoma in perimenopausal woman: case report. J Menopausal Med. 2014; 20-133-137

A Comparative Study: Antibiotic Susceptibility Testing in Non-Tuberculous Mycobacterium

Rebecca Dodds, Pauline Claxton, Olga Moncayo, Ian Laurenson

University of Aberdeen

INTRODUCTION: The incidence of difficult to treat non-tuberculous mycobateria (NTM) infections has been increasing worldwide over the past 20 years. **Aim:** we examined the consistency of antibiotic susceptibility testing (AST) against NTM, comparing results from the Scottish Mycobacteria Reference Laboratory with those from a London laboratory.

PATIENTS AND METHODS: Twenty isolates of NTM, divided into rapid-growing organisms (RGM) and slow-growing organisms (SGM), underwent AST – twice in the Edinburgh laboratory and once in the London laboratory. The results were analysed in order to assess both the intra-laboratory and inter-laboratory consistency of AST against NTM.
Essential and Categorical Agreement rates were calculated for each antibiotic, according to the consensus MIC values.

RESULTS: Essential Agreement (EA) ranged from 100% to 75% for intra-laboratory RGM, and from 100% to 37.5% for inter-laboratory RGM.
For SGM the two antibiotics focussed on were amikacin and clarithromycin as these are the most important clinically with defined breakpoints. EA ranged from 91.6% to 100% intra-laboratory, and was consistently 91.7% for inter-laboratory analysis.

CONCLUSIONS: In keeping with current literature, our results demonstrate that reproducibility of AST for NTM is inconsistent, highlighting the need for further study in this area.
Using a proposed External Quality Assurance scoring scheme the performance for many antibiotics was ‘satisfactory’.

REFERENCES:

Greenwood D. Medical microbiology. Edinburgh: Churchill Livingstone/Elsevier; 2012.
Seddon P, Fidler K, Raman S, Wyatt H, Ruiz G, Elston C et al. Prevalence of Nontuberculous Mycobacteria in Cystic Fibrosis Clinics, United Kingdom, 2009. Emerging Infectious Diseases. 2013;19(7):1128-1130.
Donohue M, Wymer L. Increasing Prevalence Rate of Nontuberculous Mycobacteria Infections in Five States, 2008–2013. Annals of the American Thoracic Society. 2016;13(12):2143-2150.
Woods G, Wengenack N, Lin G, Brown-Elliott B, Cirillo D, Conville P et al. Performance standards for susceptibility testing of mycobacteria, Norcadia spp., and other aerobic actinomycetes. 2018;.
Nikolayevskyy V, Maurer F, Holicka Y, Taylor L, Liddy H, Kranzer K. Novel external quality assurance scheme for drug susceptibility testing of non-tuberculous mycobacteria: a multicentre pilot study. Journal of Antimicrobial Chemotherapy. 2019;74(5):1288-1294

Revision Arthroplasty After Deep Prosthetic Joint Infection (DPJI): Is Operative Time a Risk Factor? A Case-Control Study From a Scottish Rural General Hospital

Daniele Fanelli, Saeed Zaki

NHS Grampian

INTRODUCTION: Revision arthroplasty is a fearsome complication after total hip and knee replacement, representing both a clinical and economic burden1. In this study, we investigated the rate of revisions arthroplasties at our institution over a 5-year period and the relationship between prolonged operative time and risk of revision arthroplasty.

PATIENTS AND METHODS: The operative time of a control group of 50 uneventful hip and knee replacements was compared to that of 10 procedures who subsequently required revision arthroplasty. Two-tailed Student's T-tests and univariate regression analysis were used to investigate the predictive role of operative time.

RESULTS: A total of 272 cemented THA and 263 cemented TKA were performed at our institution in the five-year period time. Revision rates were 1.83% for THA and 1.90% for TKA, which are comparable to the national mean (1.8 and 1.0 respectively2). Although the surgical time of procedures that required subsequent revision (105.8 ± 27 min) was longer than that of the control group with uneventful procedures (96.86 ± 17.86 min), the difference was not statistically significant ($p=0.19$). In the regression model, surgical time was not associated with an increased risk of revision arthroplasty ($p=.20$, $\beta = .020$, C.I .989 – 1.052).

CONCLUSIONS: Operative time was not a risk factor for revision THA and TKA in this series of procedures. Other factors, such as age, comorbidities, number of previous operations or technical aspects should be investigated as a potential cause of revision arthroplasty. Our rates of revision might suggest that even hospitals with a low volume of cases might expect acceptable rates of revision.

REFERENCES:

1 Bozic, K. J., Kamath, A. F., Ong, K., Lau, E., Kurtz, S., Chan, V., Berry, D. J. (2014). Comparative Epidemiology of Revision Arthroplasty: Failed THA Poses Greater Clinical and Economic Burdens Than Failed TKA. Clinical Orthopaedics and Related Research®, 473(6), 2131-2138. doi:10.1007/s11999-014-4078-8

2 Kandala, N., Connock, M., Pulikottil-Jacob, R., Sutcliffe, P., Crowther, M. J., Grove, A., Clarke, A. (2015). Setting benchmark revision rates for total hip replacement: Analysis of registry evidence. Bmj, 350(Mar09 1). doi:10.1136/bmj.h756

3 Lenguerrand, E., Whitehouse, M. R., Beswick, A. D., Toms, A. D., Porter, M. L., & Blom, A. W. (2017). Description of the rates, trends and surgical burden associated with revision for prosthetic joint infection following primary and revision knee replacements in England and Wales: An analysis of the National Joint Registry for England, Wales, Northern Ireland and the Isle of Man. BMJ Open, 7(7). doi:10.1136/bmjopen-2016-014056

Are Foundation Doctors appropriately trained to carry out blood sampling from PICC lines?

Samuel Birks, Sophie Fisk

Yorkshire and Humber Foundation School

INTRODUCTION: Peripherally Inserted Central Catheters (PICCs) are venous access devices used in hospital inpatients with difficult venous access or those who require prolonged venous access. Improper handling of PICCs when taking blood samples can lead to complications such as PICC line infections, bacteraemia, occlusion of the line or spurious blood sample results.[1] As foundation doctors, we are expected to take blood samples via PICCs for certain patients. We identified that a minority of foundation doctors had had formal training to perform this procedure despite the GMC stating "8…You should only attempt practical procedures if you have been trained to do so, and only under supervision that is appropriate to your level of competence."[2]
We undertook this quality improvement project to identify the need for formal training in blood sampling from PICCs, set up a training session and record whether this improved the knowledge and confidence of foundation doctors undertaking this procedure.

PATIENTS AND METHODS: We developed 3 online surveys via Google Forms and used this to collect data from foundation doctors regarding technique and confidence in blood sampling from PICCs at various stages of training:
- 1st survey: FY1/2 doctors in July 2018 at the end of their 1st or 2nd year in training
- 2nd survey: FY1 doctors in August 2018 at the start of their 1st year in training
- 3rd survey: FY1 doctors in October 2018 after the organised teaching session

RESULTS: Survey 1 showed that 99% of FY1/2 doctors at the end of their current year of training had sampled blood from PICCs despite only 7% having had formal training. 82% of trainees felt confident in their technique despite demonstrable disparity from best practice.
Survey 2 showed that 28% of FY1s at start of their training had sampled blood from PICCs despite only 7% having formal training to do so. Confidence in the procedure was poor with 21% and 52% being intermediately and not confident respectively.
Survey 3 showed that confidence levels in FY1s were significantly higher following the training session with 73% and 27% being confident and intermediately confident respectively. It also showed that the trainees who had underaken teaching had the highest rates of knowledge of the safe sampling technique of the 3 cohorts.

CONCLUSIONS: Over the course of the foundation programme, almost all doctors are expected to take blood samples from PICCs. In Sheffield Teaching Hospitals, 90% of foundation doctors have not received any formal training to perform this procedure. Despite this, confidence in the procedure appears to increase over the course of the foundation programme but improper sampling practice is still carried out. We have shown that implementing a simple teaching session improves both the confidence of FY1 doctors in undertaking blood sampling from PICCs, and their knowledge of the safe sampling technique. These improvements will lead to better sampling practice amongst foundation doctors and aims to reduce PICC line complications for patients.

REFERENCES:
1. Grau D, Clarivet B, Lotthe A, Bommart S, Parer S. Complications with peripherally inserted central catheters (PICCs) used in hospitalised patients and outpatients: a prospective cohort study. Antimicrob Resist Infect Control. 2017;6:18.
2. General Medical Counsel (2016). Achieving Good Medical Practice: guidance for medical students. Manchester:General Medical Council.

Positive Documentation: A QI Project in Pregnancy Testing in Colorectal Surgery

Zack Hassan, Tara Womersley, Kate Womersley

Scotland Foundation School

INTRODUCTION: Every woman of childbearing age should be offered a pregnancy test before surgery. In the emergency setting, pregnancy is an important differential diagnosis. However, checklists currently in use encourage documentation of testing (yes/no) instead of documentation of results (positive/negative). This project audited the pregnancy testing across one surgical department and improve the rate in the emergency setting through interventions focusing on the admissions unit.

PATIENTS AND METHODS: Hypothesis – We hypothesised that the pregnancy testing rate would be higher in the elective setting where positive/negative documentation is used, and that testing would be lower at the extremes of age. A second hypothesis was that the rate would be improved by prompts that encouraged admitting staff to document the test.
Methodology - This audit comprised 2 cycles looking at all patients admitted under Colorectal Surgery in February and July. Inclusion criteria were being female aged 15-55 and under Colorectal Surgery on TRAK. Exclusion criteria were surgery being cancelled, taking place outside WGH or privately. A retrospective review of electronic and scanned notes was performed for the remaining 54 patients in February and 48 patients in July. Any documentation of the pregnancy test result was acceptable. Cross-tables were constructed to stratify results according to age, type of surgery, and whether emergency admissions went on to receive surgery. Our first intervention was an awareness campaign. A second intervention has been to change nursing paperwork to prompt documentation of the test as positive or negative, for which data collection is ongoing.

RESULTS: Results: 12 out of 13 women had a pregnancy test in the elective setting and 14 out of 27 women did in the emergency setting. (OR 0.04 95% CI 0.01-0.37). There was no difference in the proportion between emergency patients who went on to have surgery and those who did not. In the emergency setting, 0 of 10 women aged 46 or over had a documented test, while 7 out of 12 women aged 31-40 did. Documentation of the test was usually on nursing or urinalysis sheets, but rarely on pre-surgery checklists. After re-auditing, 12 out of 13 women had a pregnancy test in the elective setting and 7 out of 28 women did in the emergency setting. (OR 0.02 95% CI 0.002-0.19) The odds ratio of receiving a test after exposure to the intervention was 0.48. (95% CI 0.17 – 1.38). 9 patient records were inaccessible. Interpretation: In the elective setting, pregnancy testing is almost always documented. The small increase in testing in 45-55 year old women that was not statistically significant. An age-related relationship seen in February was not seen after the intervention, but this appears to have been due to generally low rates of testing. As the confidence interval for the reaudit comparison includes the null value, this could represent no significant change.

CONCLUSIONS: These data support the hypothesis that pregnancy testing is better conducted when tests are documented as positive or negative, but not that there is an age-related relationship to testing. Raising awareness is not a sufficient factor to achieve 100% documentation. Future interventions focusing on documenting tests as positive/negative rather than yes /no may improve this in future.

REFERENCES:
Wilson MSJ, Powell-Bowns M, Robertson AG on behalf of the Scottish Surgical Research Group, et al National multicentre audit of pregnancy status in general surgery admissions in Scotland Postgraduate Medical Journal 2017;93:480-483.

National Institute for Health and Care Excellence (2016) Routine preoperative tests for elective surgery [NICE Guideline 45] Available at https://www.nice.org.uk/guidance/ng45 [Accessed 18 October 2019]
Szumilas M. Explaining odds ratios. J Can Acad Child Adolesc Psychiatry. 2010 Aug;19(3):227-9. Erratum in: J Can Acad Child Adolesc Psychiatry. 2015 Winter;24(1):58. PMID: 20842279; PMCID: PMC2938757.

Therapies in Acute Coronary Syndrome: The Pitfalls of Prescribing

Colin Irving, Roisin Mulholland, Stefanie Lip, Dr Mhairi Sinclair, Dr Lewis Vickers

NHS Lanarkshire

INTRODUCTION: Acute coronary syndrome (ACS) is a significant health burden in NHS Lanarkshire (1). Although innovative anticoagulant and antiplatelet therapies have aided treatment of ACS in recent years, these drugs can cause prescribing errors(2). This was identified as an area of improvement at University Hospital Wishaw following recent adverse events and continued use of out-of-date ACS guidelines(3).The aim of the project to improve prescribing of anticoagulant and antiplatelet therapies in patients presenting with ACS.

PATIENTS AND METHODS: Data was collected and analysed from patients presenting to the medical receiving unit with “chest pain” and prescribing errors related to ACS loading treatment were recorded. DATIX incidents related to anticoagulant/antiplatelet prescribing were also analysed pre and post intervention. An ACS infographic was designed to increase prescribing awareness and help reduce errors. This was displayed in all clinical areas and nursing medication trolleys. Education sessions on prescribing safety and medication types were also delivered to all medical and nursing staff.

RESULTS: Two QI cycles were conducted from April-June 2019 and July-September 2019. DATIX incidents decreased from 1.3 per month pre-intervention to 0 per month post intervention and this trend was mirrored in DATIX incidents related to anticoagulant prescribing as a whole. Patients who had a prescribing error during ACS loading treatment decreased from 36% in cycle 1 (8/22) to 29% in cycle 2 (6/21).

CONCLUSIONS: In conclusion, education and a simple infographic can reduce the number of adverse incidents and prescribing errors in patients presenting with ACS. Further work will focus on wider awareness of these issues as the project is launched across other hospitals in the health board.

REFERENCES:
(1) Information Services Division. Scottish Heart Disease Statistics. URL: https://www.isdscotland.org/Health-Topics/Heart-Disease/Publications/2019-01-29/2019-01-29-Heart-Disease-Report.pdf [accessed September 2019]
(2) Ali MAS., Lobos CM., Abdelmegid MAF., El-Sayed AM. The frequency and nature of medication errors in hospitalized patients with acute coronary syndrome. International Journal of Clinical Pharmacy 2017; 39(3):542-550
(3) NHS Lanarkshire. FRM.MANACS.0891.W. Guideline for Management of Acute Coronary Syndrome. Lanarkshire: NHSL; 2013

Transitional Meningioma with Intratumoural Bleed and Associated Subdural Haemorrhage: Case Report and a Review of Literature

Jia Yi Lim, Avinash Kumar Kanodia, Mohamad Abdelsadg, Khaled Badran, Thiru Sudarshan, Guntur Prasad, Kismet Hossain-Ibrahim

University of Dundee

INTRODUCTION: Meningiomas are the commonest benign intracranial tumours and vast majority of these are categorized as Grade 1 by WHO classification. Haemorrhage associated with tumours is usually a phenomenon associated with more aggressive tumours such as glioblastomas and metastases, besides some of the grade 2/3 tumours such as oligodendrogliomas.

PATIENTS AND METHODS: - A case report on a patient with Grade 1 meningioma of transitional type, presenting with intratumoral and subdural haemorrhage.
- Literature review on 31 meningioma cases with subdural haemorrhage reported between 2001-2017 (keywords “meningioma” and “subdural haemorrhage”or “subdural haematoma” searched on “PubMed” and “Google Scholar”)

RESULTS: - Out of the 31 cases, 48% were acute, 13% sub-acute and 35% chronic subdural haemorrhage. Many cases had a combination of acute, sub-acute and/or chronic subdural haemorrhages. However, only less than 10% had bilateral haemorrhages at presentation. 38.7% also reported concurrent intratumoral bleed alongside subdural haemorrhage and only 1 case had a concomitant intraventricular haemorrhage.
- We found that the majority of meningiomas associated with subdural haemorrhage are located along the convexity (44.8%).
- Our review also showed that most meningiomas with subdural haemorrhage are of the meningothelial subtype (43.5%).

CONCLUSIONS: - Our review has shown a higher prevalence of subdural haemorrhage in meningiomas of meningothelial subtype and those located along the convexity.
- Our case is more unusual since it is a transitional meningioma with histological and radiological evidence of intratumoral haemorrhage and further radiological evidence of subdural haemorrhage, which is also less often seen.
- Due to the rarity of such tumours to present with haemorrhage, these are often treated aggressively since preoperative imaging diagnosis of meningioma is difficult to make in this situation. This case report is meant to serve as a reminder of this rare association.

REFERENCES:
*Total of 45 references, first 5 include:
1. WHO Classification of Tumours of the Central Nervous System, Revised 4th Edition, 2017 Volume Eds: Louis DN, Ohgaki H, Wiestler OD, Cavenee WK. IARC Pulications
2. Longstreth WT, Dennis LK, McGuire VM, Drangsholt MT, Koepsell TD. Epidemiology of intracranial meningioma. Cancer. 1993 Aug;72(3):639-648.
3. Whittle IR, Smith C, Navoo P, Collie D. Meningiomas. The Lancet. 2004 May;363(9420):1535-1543.
4. Louis DN, Perry A, Reifenberger G, von Deimling A, FigarellaBranger D, et al. The 2016 World Health Organization Classification of Tumors of the Central Nervous System: a summary. Acta Neuropathologica. 2016 Jun;131(6):803-820.
5. Yao YT. Clinicopathologic analysis of 615 cases of meningioma with special reference to recurrence. J Formos Med Assoc. 1994 Feb;93(2):145-152.

Improving Certificate of Incapacity Documentation in a District General Hospital

Kang CK, Nolli T, Habicht D

University of Dundee

INTRODUCTION: Assessment of capacity to medical treatment is an important legal and ethical issue.[1] An estimated 30-52% of patients admitted to hospital lack capacity.[2] At the beginning of 2018, NHS Tayside introduced the revised Certificate of Incapacity. In addition to the Section 47 certificate designed by the Scottish Government, the revised Certificate of Incapacity introduced by NHS Tayside now includes a treatment plan, a checklist to aid assessment of capacity, and a prompt to ensure that clinicians have made reasonable enquiries to ascertain if a patient has an appointed Welfare Guardian/Attorney. An initial audit was performed to determine how well the revised Certificates of Incapacity were being completed in the downstream medical wards at Perth Royal Infirmary (PRI). This was followed on by interventions, as part of a Quality Improvement project, and a 2nd audit cycle was subsequently performed to assess for any improvements in documentation.

PATIENTS AND METHODS: In the 1st audit cycle, a total of 68 Certificates of Incapacity across 4 downstream medical wards were analysed over a period of 3 weeks. This was achieved by reviewing the medical notes of current inpatients on a twice weekly basis. In order to decide if a Certificate of Incapacity was satisfactorily completed, a proforma was designed to aid decision making. The results of the 1st audit cycle was presented at the PRI Medical Unit Lunchtime Meeting in order to increase awareness and education. Other interventions as part of this effort include attaching a completed 'example' in all the ward doctor's rooms for reference, signposting useful online learning resources, and sending an email blast to medical staff within the department. After 2 weeks, the 2nd audit cycle was performed using the same methodology. A total of 63 Certificates of Incapacity across the same downstream medical wards were analysed over a period of 3 weeks. The results of the 2nd audit cycle was also presented at the PRI Medical Unit Lunchtime Meeting.

RESULTS: The 1st audit cycle showed that only 47% (n=32) of Certificates of Incapacity were completed accurately. From the 36 Certificates of Incapacity which were completed inaccurately, 22.2% (n=8) had no treatment plan, 75.0% (n=27) had an incomplete assessment of capacity, and 88.9% (n=32) had no reasonable enquiries made to ascertain if a patient has an appointed Welfare Guardian/Attorney. After interventions detailed above were carried out, the 2nd audit cycle revealed that 71% (n=45) of Certificates of Incapacity were completed accurately. All 63 forms had a completed treatment plan. From the 18 Certificates of Incapacity which were completed inaccurately, 55.6% (n=10) had an incomplete assessment of capacity and 77.8% (n=14) had no reasonable enquiries made to ascertain if a patient has an appointed Welfare Guardian/Attorney.

CONCLUSIONS: This Quality Improvement project has improved documentation of Certificates of Incapacity across the downstream medical wards at PRI. However, there is still room for improvement. Therefore, further audit cycles were made available to the next group of Foundation Doctors at PRI Medical Unit to ensure sustainability in improvement.

REFERENCES:

1. General Medical Council (2013). Good Medical Practice.
2. NHS Education for Scotland (2012). Think Capacity Think Consent. Supporting application of the Adults with Incapacity (Scotland) Act (2000) in Acute General Hospitals.

Improving quality and documentation of bedside thoracic ultrasound

Kwon, Carol; Yap, Soo Min; Wakefield, Michael; Short, Philip

University of Dundee

INTRODUCTION: Documentation of bedside ultrasonography performed on in-patients was highlighted by respiratory specialty doctors as being inconsistently completed, and may also be seen as arduous and time-consuming. An audit was carried out for one month in a respiratory ward at a university teaching hospital to assess how complete documentation was, as a representation of quality of bedside ultrasonography carried out. A bedside ultrasound documentation sticker was then introduced amongst all registrars, with one month cycle of auditing carried out again. The results showed a significant improvement in documentation, but incomplete uptake of sticker usage. A presentation was made to the whole department demonstrating the findings and explaining the rationale, and another audit cycle is currently being done in the month of October, 2019.

PATIENTS AND METHODS: Adult in-patients in the respiratory ward with x-ray evidence of pleural effusion/exudate, and bedside ultrasound documented in notes.

RESULTS: Statistically significant (p-value <0.05) improvements were made in documentation of patient position, depth to pleura, echogenicity, presence of septations, depth of fluid present, documentation of M mode and Doppler use, visualisation of spleen/liver/kidneys, with the use of sticker.

CONCLUSIONS: Sticker use, and departmental discussion significantly improve quality and documentation of bedside ultrasonography.

REFERENCES:
The Royal College of Radiologists. Focused Ultrasound Training Standards. December 2012. Available from:
https://www.rcr.ac.uk/system/files/publication/field_publication_files/BFCR(12)18_focused_training.pdf

Neurosurgery Notes Audit- Highlighting successes, and areas for improvement in documentation

Kwon, C., Fadelalla, M., Hossain-Ibrahim, K, Mowle, D.

Data collection team: Aitken, Bethany, Yacoub, Leilah
Supervisors: Hossain-Ibrahim, Kismet and Mowle, David

University of Dundee Medical School

INTRODUCTION: Medical notes are an essential part of record keeping for patients on any medical or surgical ward in hospitals. Good record keeping contributes to patient safety, quality of care, professional best practice, and also forms a legal document, important in medical defence. Despite this, record-keeping can often be of low priority, with the literature reporting problems with illegibility, inconsistency, and incomplete information. We have completed a 2225 point audit across 20 patients once discharged to assess completeness of basic documentation, and aspects most relevant to neursurgery.

PATIENTS AND METHODS: 20 adult patients, discharged from neurosurgical ward between August 15-September 19th 2019. 68 pages of medical notes audited. 146 patient-days audited. Duration of admission >/= 1 day. Retrospective audit. Analysed in excel.

RESULTS: Names and CHIs completed on medical notes headers 97% and 95% of the time respectively. Consultant completed on medical notes headers 45.59% of the time. Thromboprophylaxis plan was completed on admission only 73.68% of the time. Functional assessment scale completed only 57.14% of the time on admission. Daily ward round stickers- low scoring areas were Duty consultant/pt consultant/thromboprophylaxis, NEWS Extremely low performing areas- Bloods (22.58%), antibiotics (22.22%), steroids (19.35%) – but may reflect the low level of documentation of when it is not applicable to the patient.

CONCLUSIONS: Admission documentation can be improved to help clarify both throboprophylaxis plan and patient's named consultant designation. Admission documentation and daily ward round stickers were also updated to reflect recommendations from departmental presentation. Re-auditing after implemementing new clerk-in documentation and ward round stickers will help to assess improvements in these areas.

REFERENCES:

Good medical practice. (2013). London: GMC. https://www.gmc-uk.org/-/media/documents/good-medical-practice---english-1215_pdf-51527435.pdf?la=en
Generic Medical Record Keeping Standards. (2015). London: RCP https://www.rcplondon.ac.uk/projects/outputs/generic-medical-record-keeping-standards
Abdelrahman Wedad, Abdelmageed Abdelrahman. Medical record keeping: clarity, accuracy, and timeliness are essential BMJ 2014; 348 :f7716 https://www.bmj.com/content/348/bmj.f7716

Implementation of the 'Decompensated Cirrhosis Care Bundle': A Quality Improvement Project.

Dr Nikhil Lal, Dr Joseph Roscamp, Dr Laura Harrison

Sheffield Teaching Hospital NHS Foundation Trust

INTRODUCTION: The British Society of Gastroenterology (BSG) 'Care Bundle' was developed to ensure effective evidence-based treatments are delivered within the first 24 hours of admission1. We aimed to implement the BSG 'Care Bundle' at a major teaching hospital with the use of quality improvement methodology and assess its impact on patient care within the first 24 hours of admission.

PATIENTS AND METHODS: A retrospective audit was conducted on the management of patients admitted with decompensated liver disease to the acute medical admissions unit between November 2018 to January 2019. Interventions applied included informative flyers, teaching presentation on the care bundle and reminder emails to clinicians. A prospective audit was conducted post-implementation between March to June 2019 to complete the Plan-Do-Act-Study (PDSA) cycle. A logistic regression and Kruskal-Wallis test were performed using the IBM SPSS software platform.

RESULTS: Pre-implementation and post-implementation groups included 29 and 28 patients, respectively. Alcohol-related liver disease was the primary aetiology across all groups. The care bundle was completed in 14 patients (50%) in the post-implementation group. The completion of the care bundle significantly increased the requests for blood cultures and urine dipstick within 6 hours of admission (p-0.005 & p-0.01, respectively). Patients with a care bundle were more likely to

have their ascitic samples correctly sent for white cell count, culture and fluid albumin (p-0.025). Furthermore, the care bundle increased the documentation of previous alcohol intake (p-0.01). Even though all suitable patients with a care bundle had an ascitic tap (n=5), no significant difference was noted between the number of ascitic taps performed and time to ascitic tap between patients with and without a care bundle (p-0.099 & p-0.14, respectively).

CONCLUSIONS: The interventions enhanced the uptake of the BSG care bundle at our hospital. The care bundle was noted to significantly increase the request for appropriate tests on ascitic samples, blood cultures and urine dipstick, alongside improving the documentation of alcohol intake. Further PDSA cycles are required to sustain the use of the care bundle. Formal training of junior doctors should be considered to increase the number of diagnostic ascitic taps.

REFERENCES:

1. Dyson, J K et al. “Implementation of a 'care bundle' improves the management of patients admitted to hospital with decompensated cirrhosis.” Alimentary pharmacology & therapeutics vol. 44,10 (2016): 1030-1038. doi:10.1111/apt.13806

Improving vancomycin therapeutic drug monitoring

Lim Su Kwan (FY2), Emma Clark (Clinical pharmacist), Peter Davies (Specialty Registrar)

Ninewells Hospital, Dundee/NHS Tayside

INTRODUCTION: Vancomycin is an effective and widely used glycopeptide antibiotic in orthopaedics. It has bactericidal activity against gram positive organisms. It requires therapeutic serum levels to be reached before it becomes effective. In orthopaedics, antibiotic courses tend to be of a long duration. A start date cannot be set for the course unless vancomycin is within a therapeutic level. Delays in reaching therapeutic levels may increase the risk of developing antibiotic resistance or treatment failure, increase the cost of treatment and length of stay.1,2

PATIENTS AND METHODS: The criteria to be measured included the number of days for patients to reach therapeutic vancomycin levels (15-20) and length of hospital stay. Data collection for cycle 1 (August 2018 – September 2018) and cycle 2 (October 2018 – November 2018) were identified retrospectively and prospectively. An antibiotic column was placed in the ward handover sheet and foundation year doctors were educated on the importance of diligent therapeutic antibiotic monitoring.

RESULTS: Ten patients were included in cycle 1 and 14 patients in cycle 2. 30% of patients from cycle 1 took more than one week to reach therapeutic level and this has improved to only 7% in cycle 2. The length of hospital stay has reduced significantly in cycle 2.

CONCLUSIONS: The addition of an antibiotic column on the ward handover, combined with education for foundation doctors, led to improvements in clinical provision of vancomycin on the orthopaedic wards.

REFERENCES:

1. Antibiotic Prophylaxis in Orthopaedic Surgery [Internet]. Nhstaysideadtc.scot.nhs.uk. 2018 [cited 10 November 2018]. Available from: https://www.nhstaysideadtc.scot.nhs.uk/Antibiotic%20site/Antibiotic%20front%20page.htm

2. Intravenous Vancomycin Use in Adult-Intermittent Infusion [Internet]. Nhstaysideadtc.scot.nhs.uk. 2017 [cited 13 November 2018]. Available from: https://www.nhstaysideadtc.scot.nhs.uk/Antibiotic%20site/Antibiotic%20front%20page.htm

A Quality Improvement Project: Improving venous thromboprophylaxis prescribing in the Acute Medical Unit

Lim Su Kwan, Clare Silverwood, Zaw Thant Lwin

Ninewells Hospital, Dundee/NHS Tayside

INTRODUCTION: Venous thromboembolism (VTE) prophylaxis is an important management plan for every patient admitted to the Acute Medical Unit (AMU) in a hospital. Bleeding risk and possible contraindication to antithrombotic agents must be assessed before instituting VTE prophylaxis. Pulmonary embolism remains as the leading cause of preventable in-hospital death. Based on NICE guideline, VTE prophylaxis decision has to be made within 14hours of admission to the AMU.1

PATIENTS AND METHODS: The criteria to be measured included percentage number of patients who had VTE prophylaxis decision made within 14hours of admission to the Acute Medical Unit (AMU). 5 patients data are randomly collected every week for 12months, from August 2018 to July 2019 in the AMU. Microsoft excel software was used to generate the percentage. The specific problem identified was VTE prophylaxis was very poorly prescribed in the AMU. This led to a VTE flow chart been designed, based on the local hospital, regional Scottish and NICE guidelines.1,2,3 This is to guide junior doctors about when and who to be prescribed dalteparin sodium as VTE prophylaxis. A period of intervention was assigned for three months. Then, data was collected again. The aim was to have a consistency in the good practice. Continuous interventions were done at two monthly intervals by presenting this project to all medical staff in a departmental meeting, which led to addressing this practice to the senior and junior doctors, considering an online app and adding some data into the VTE flow chart. All medical staff were informed regarding the flow chart through emails and text messages.

RESULTS: The data improved from less than 35%, which is before VTE flow chart implementation to more than 60% after implementation. Then, there was a consistency in practice at more than 80% for half of the year. The final data collection saw 100% of patients in the AMU had VTE prophylaxis decision made within 14hours of admission.

CONCLUSIONS: The timing for VTE prophylaxis commencement based on NICE guidelines is of great importance because this is the kind of medical problem we can prevent largely provided patients receive appropriate VTE prophylaxis dose within the targeted time frame. We do believe that this VTE flow chart would clearly guide our medical colleagues as to when to administer dalteparin sodium and which patients should receive it.

REFERENCES:

1Venous thromboembolism in over 16s:reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism. (2018). [pdf] NICE2018. Available at: https://www.nice.org.uk/guidance/ng89 [Accessed 3 Sep. 2018].
2Prevention and management of venous: A National Guideline. (2014). [pdf] Healthcare Improvement Scotland: SIGN guideline. Available at: https://www.sign.ac.uk/assets/sign122.pdf [Accessed 3 Sep. 2018].

3Staffnet, NHS Tayside. (2018). Venous Thrombus Disease. [online] Available at: http://staffnet.tayside.scot.nhs.uk/OurWebsites/AcuteMedicineUnit/ClinicalGuidelines/VenousThrombusDisease/index.htm [Accessed 3 September2018].

Assessing General Surgical Clinical Notes Using the STAR Tool at QEUH

Marcus McClean, Aditya Jaidev, Paul Glen, Laura Osbourne, George Kourounis

NHS Greater Glasgow and Clyde

INTRODUCTION: Accurate documentation of medical notes is a key aspect of patient care, outlined as a requirement by the General Medical Council1. Inadequate documentation leads to adverse events and is often examined closely during medico-legal reviews.
Our primary aim was assessing the quality of notes in our department and identifying areas of improvement. Secondly, all foundation doctors are required to show participation in QI projects for ARCP. Thus, our secondary aim was introducing foundation doctors to supervised QI projects and promoting opportunities beyond data collection.

PATIENTS AND METHODS: The validated Surgical Tool for Auditing Records2 (STAR) was used to retrospectively assess the quality of medical documentation in our department during between August and November 2018. The project was completed by a team of six foundation doctors supervised by two research fellows. A clerking proforma was created to address the main area of weakness and distributed via electronic distribution and physical copies to doctors. A second cycle was carried out after the introduction of this document and results directly compared pre and post intervention.

RESULTS: 85 notes were reviewed during the first cycle. Median score was 85%. Main area of weakness was initial clerking, with median score of 75%. A clerking proforma for patients arriving to the wards without admission clerking was created by foundation doctors. 81 notes were reviewed post-intervention with median overall score of 88%. Median initial clerking score remained 75%.

CONCLUSIONS: Best outcomes were seen in structured documents (consent, operation note, anaesthetic note). Introduction of further structured documentation for ward admissions did not improve outcomes. Lack of admission documentation on wards was likely result of high workload on foundation doctors rather than absence of specific proforma. This suggested that correct documentation is not an independent issue but rather a reflection on the department as a whole. Foundation doctors benefited from structured audit and gained experience beyond purely data collection.

REFERENCES:

1. GENERAL MEDICAL COUNCIL. GMC DOMAIN 1 - Knowledge skills and performance [Internet]. GMC ONLINE. 2013 [cited 2019 Oct 8]. p. 19–21. Available from: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/good-medical-practice/domain-1---knowledge-skills-and-performance#paragraph-19
2. Tuffaha H, Amer T, Jayia P, Bicknell C, Rajaretnam N, Ziprin P. The STAR score: a method for auditing clinical records. Ann R Coll Surg Engl [Internet]. 2012 May [cited 2019 Oct 8];94(4):235–9. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22613300

A review of the management of asymptomatic cervical polyps noted at routine smear in Scotland

Dr Katie McKay, Dr Caithlin Neill

University of Dundee

INTRODUCTION: Aim: To review the management of asymptomatic cervical polyps in Scotland. Asymptomatic cervical polyps detected at routine cervical smear are frequently referred to gynaecology. Literature review suggests that the incidence of malignant change in such polyps is negligible. Our department does not have a management policy, our aim was to ascertain whether other Scottish hospitals have guidance.

PATIENTS AND METHODS: A five-question survey was sent to a lead clinician of the gynaecology department of 12 Scottish hospitals within 9 health boards. The questions addressed each department's current management of asymptomatic cervical polyps, opinions on current methods, if polypectomy is necessary in asymptomatic patients and if further investigation is required.

RESULTS: Eighteen responses were received. Nine responses from Lothian, 2 from Grampian & 1 from each of the other Health Boards. 15 respondents stated the departmental policy was to see these patients in clinics and perform polypectomy. Two respondents review in clinic and offer avulsion if requested. Only one department did not routinely offer avulsion. Management differed between hospitals within the same Health Board. Three hospitals have no set policy and management is left to the individual clinician. Of the 17 departments that routinely remove asymptomatic polyps, 8 agreed with current practice, 8 stated removal was unnecessary and 1 stated that if an asymptomatic polyp was found incidentally then polypectomy is not likely to be necessary but practice nurses are not sufficiently experienced to make this decision, therefore, patients should be referred to Gynaecology Outpatient Clinic.

CONCLUSIONS: We would recommend a unified evidence-based approach of conservative management for asymptomatic polyps found incidentally on examination of premenopausal women. Although, the risk of malignancy in symptomatic polyps is also minimal, we would recommend Gynaecology assessment to avoid misdiagnosis. Post-menopausal women are at greater risk of both malignancy and symptoms associated with cervical polyps, therefore, polypectomy is indicated for these patients. We would suggest that declining referrals of asymptomatic polyps in pre-menopausal women will prevent unnecessary clinic appointments and use of histopathology resources. This would allow cost savings without affecting patient care. Future Prospects: We aim to create a nation-wide, evidence-based guideline for the management of cervical polyps that optimizes patient care whilst simultaneously makes substantial expenditure cuts and reduces pressure on gynaecology outpatient services.

Improving Junior Doctor Handover in Forth Valley Royal Hospital

Aditya Mehta, Jess McQuillian, Duncan Rutherford, Paul Hendry

INTRODUCTION: With increasing frequency of shift change secondary to European working time directive, effective handover between medical teams is essential as "incomplete or delayed information can compromise safety, quality and the patient's experience of health care" (2). We aimed to assess the quality of handover and further improve it with a structured proforma.

PATIENTS AND METHODS: We prospectively audited quality of all handovers given by Foundation Year 1 doctors (FY1s) to Hospital at Night (H@N) at Forth Valley Royal Hospital over 7 consecutive

days. Subsequently, a proforma was created using guidelines on good handover practice from Royal College of Surgeons England (RCSE) (1). This proforma was implemented and consequently quality of handover was re-audited over a further 7 consecutive days.

RESULTS: Pre intervention only 2.7% (n=2) of all 74 cases met all the criteria used. Criteria that were most commonly missed out were “Urgency of Review”, “DNAR status” and “Relevant Past Medical History”. Pre-intervention, “Diagnosis/Current Management Plan” was handed over in 56% (n = 42) of cases and “Outstanding jobs” were handed over in 58.7% (n = 44) of cases. Post-intervention a significant improvement was observed with 18 (n=64) cases (28.1%) meeting all criteria. Specific areas that showed large improvements post-intervention included: “Diagnosis/Current Management Plan” which increased by 23.7%; “Outstanding Jobs” which increased by 33.5%; “PMH” which showed a 26.5% improvement and “Patient Location” which improved by 15.7%. Furthermore a 12.2% increase was noted in “Urgency of Review”, 9.4% increase in “DNAR status” and 2.2% increase in “Reason for Handover” post-intervention.

CONCLUSIONS: Our structured proforma was successfully implemented and significantly improved quality of handover given by FY1s. Improvements were recorded in all criteria post-intervention as compared to pre-intervention, highlighting the importance of a structured proforma in helping FY1s deliver a good handover. However, despite all the criteria demonstrating improvements, it is evident that further input is required to highlight the importance of handing over “Urgency of Review” and “DNAR status” to H@N. Future audit cycles could look at the impact of presenting either at a hospital quality improvement meeting or at FY1s teaching.

REFERENCES:

1. Safe Handover: Guidance from the Working Time Directive working party [Internet]. London; 2007. Available from: https://www.rcseng.ac.uk/-/media/files/rcs/library-and.../non.../safe-handovers.pdf
2. Chapter 32 Structured patient handovers: Emergency and acute medical care in over 16s: service delivery and organisation [Internet]. Nice.org.uk. 2019 [cited 16 October 2019]. Available from: https://www.nice.org.uk/guidance/ng94/evidence/32structured-patient-handovers-pdf-172397464671

Risk Factor Screening in the Vascular Patient

Dr Jacob Mewse, Ms Jennifer Nash, Mr Steven Boom

University Hospital Ayr (Hospital), NHS Ayrshire and Arran (health board)

INTRODUCTION: In accordance with the European Society of Cardiology and the European Society for Vascular Surgery (ESVS), all vascular patients must be screened for cardiovascular risk factors as the risk of peripheral arterial disease increases sharply with age and exposure to major cardiovascular risk factors such as smoking, hypertension, dyslipidaemia and diabetes mellitus.

PATIENTS AND METHODS: The surgical admission proforma for all patients admitted to the Vascular Surgery Unit at University Hospital Ayr were analysed over a three week period to assess whether risk factor screening was regularly performed on admission in accordance with ESVS guidance. Following collection of the data, a vascular surgery admission checklist was created and made available as a sticker to insert into the surgical admission proforma to help ensure risk factor assessment and thereby modification. The results of the initial audit were presented at the local General Surgical Academic Meeting along with training on cardiovascular risk factor modification, and a further re-audit was carried out following intervention.

RESULTS: During the initial three week audit, 27 patients were admitted to the vascular surgery ward. Of these patients; 9 had their hypertensive status documented (33.3%), 9 diabetic status (33.3%), 2 cholesterol status (7.4%), 22 smoking status (81.5%), 16 blood pressure (59.3%), and from the blood tests in accordance with ESVS, 18 had their glucose checked(66.7%), 7 HbA1c (25.9%) and 12 lipid profile (44.4%). Following the introduction of a vascular surgery admission checklist, re-audit was carried out in which 26 patients were admitted over a three week period, results showed a notable improvement. Nineteen patients had their hypertensive status recorded (73%), 21 diabetic status (80.8%), 15 cholesterol status (57.7%), 25 smoking status (95.2%) and from the blood tests 20 had their glucose checked (76.9%), 20 HbA1c (76.9%) and 20 lipid profile (76.9%).

CONCLUSIONS: The initial audit confirmed that vascular patients were not appropriately screened for cardiovascular risk factors in accordance with the ESVS. Through education and the implementation of the admission checklist, re-audit demonstrated that there has been an improvement in risk factor screening. This will aid in the identification of those at increased risk of cardiovascular disease so interventions can be made as early as possible.

REFERENCES:

Aboyans, V. et al. 2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS). European Heart Journal 39, 763-816 (2017).

Is a second group and save sample necessary for elective laparoscopic cholecystectomy?

Esther Ngan

Perth Royal Infirmary, NHS Tayside

INTRODUCTION: Laparoscopic cholecystectomy is one of the most common day case procedure performed associated with low bleeding rates. 1,2
There are currently no national guidelines for the use of cross match and group and save sample. The use of routine group and save sample is not included in NICE guidance of preoperative tests for elective surgery. The need for group and save sample depends upon the severity and likelihood of blood loss.3 At Perth Royal Infirmary Hospital, we follow our local Maximum Surgical Blood Ordering Schedule (MSBOS) guidelines which indicates that a valid group and save sample is required all patients undergoing laparoscopic surgery. Two group and save samples usually from two different site at two different times are required in order for cross matched bloods to be provided.
We aim to review the need of the second group and save sample for elective laparoscopic cholecystectomy patients aiming to potentially reduce cost on the trust without compromising patient care.

PATIENTS AND METHODS: Restrospective data collection for general surgical patients in a district general hospital, Perth Royal Infirmary, over April, May and June 2019
- Age of patient
- Gender of patient
- If two samples of pre-operative group and save sample are taken
- If peri-operative transfusion is required
- Timing of transfusion if required

RESULTS:
- 95% of patients had a valid group and save sample

- No patients required blood transfusion
- Total cost of the group and save sample is £ 28. 71. The breakdown of it includes £24 for BTS to process each sample + £4.71 for the tube itself. This excludes cost of venepuncture/ overhead costs.
- Total cost for the trust over the three-month period is £ 1,780.02

CONCLUSIONS: We concluded that the second group and save sample is deemed unnecessary for elective cholecystectomy patients and the need for this can reconsider with potential of cost reduction and saving manpower time. Our recommendation is to omit the second group and save sample in this group of patients unless abnormal antibodies are detected on the first sample or patients are deemed high risk.

REFERENCES:

1. Duca, S., Bala, O., Al-Hajjar, N., Iancu, C., Puia, I., Munteanu, D. and Graur, F. (2003). Laparoscopic cholecystectomy: incidents and complications. A retrospective analysis of 9542 consecutive laparoscopic operations. HPB, 5(3), pp.152-158.
2. Hamza, N., Pereira, M. and Gilliam, A. (2015). Routine 'group and save' is unnecessary on the day of surgery for elective laparoscopic cholecystectomy. The Bulletin of the Royal College of Surgeons of England, 97(6), pp.E1-E4.
3. Nice Guidelines. (2016). Routine preoperative tests for elective surgery guidance. [online] Available at: https://www.nice.org.uk/guidance/ng45 [Accessed 8 Sep. 2019].

Informed consent: are we offering patients with additional written information? – A Quality Improvement Project

Subbramanian Palaniappan, Khalid Haroon, (Sharon)Yen Ming Chan, Amlan Banerjee

Aberdeen Royal Infirmary - NHS Grampian and University of Aberdeen

INTRODUCTION: Shared decision making between patients and clinicians underpins the contemporaneous informed consent process. Additional written information (AWI) has been shown to improve and complement this process. This is supported by recommendations from the Royal College of Surgeons of England (RCSEng). AWI includes any digital media or patient information leaflets (PIL) endorsed by registered specialist bodies or commercial companies such as EIDO to improve informed consent.
Aims/Objectives:
(1) To assess local standards of obtaining informed consent with aid of AWI as recommendation.
(2) To improve current practice of provision of AWI in obtaining informed consent.

PATIENTS AND METHODS: Closed-loop audit performed in April 2018 (first audit) and July 2018 (re-audit) in Raigmore Hospital Surgical Department. RCSEng publication 'Consent: Supported Decision-Making' section 4.4 was used as standard. Prospective data collection on all consecutive patients undergoing both elective and emergency surgery over one-week period was performed. Data obtained included demographics, types of operation and details of informed consent. Data recorded on Microsoft Excel and analysed using embedded statistical package. Intervention strategies included local education and easy accessibility to AWI in dedicated areas on ward. Re-audit was performed following intervention.

RESULTS: First audit: Of 31 patients, 55% (n = 17) were emergency cases. 18 (61%) were consented by consultants. 6% (n = 2) received AWI, 65% (n = 20) received no AWI whilst 29% (n=9) had drawn diagrams only. Re-audit: Of 40 patients, 17.5% (n=7) were emergency cases. 33 (82.5%) were consented by consultants. 45% (n=18) received AWI of which 11/18 patients received a combination

of AWI and drawn diagrams, 47.5% (n=19) received no AWI whilst 7% (n=3) had drawn diagrams only. AWI compliance increased from 6% to 45%.

CONCLUSIONS: Provision of AWI in the process of informed consent was improved using simple, low-cost, targeted intervention in our local surgical department. Similar strategies could be implemented across all fields of medicine and surgery to improve shared decision making between patients and clinicians.

REFERENCES:

1) Royal College of Surgeons of England. Consent: Supported Decision-Making - A Guide to Good Practice [Internet]. London: Royal College of Surgeons of England; 2016 p. 14. Available from: https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/good-practice-guides/consent/

Blood Transfusion Consent Documentation in Ward 11a, Queen Elizabeth University Hospital (QEUH), Glasgow

Dr Ruben Perumal, Ms Kirsten Hamilton

NHS Greater Glasgow and Clyde

INTRODUCTION: Although written consent for blood transfusion is not compulsory in British hospitals, patients should be adequately counselled prior to receiving blood products and this should be clearly documented. Blood transfusion forms and patient information leaflets aid in this process, however there is lack of emphasis on this in a busy ward setting. The aim of this audit is to assess the blood transfusion consent documentation in ward 11a in the Queen Elizabeth University Hospital (QEUH), Glasgow and evaluate improvement after educational session with junior doctors regarding this.

PATIENTS AND METHODS: List of patients who had been transfused in ward 11a with any blood products (25 patients) were obtained from the blood bank for March and April 2019. Electronic patient records and scanned blood forms were reviewed for consent discussion, documentation and patient information leaflets. Throughout May, brief informal education sessions were conducted with FY1s during lunchtime. This was then followed by re-auditing for changes in the above parameters in June and July 2019 (15 patients transfused in this month).

RESULTS: Up to 80% of transfusions of ward 11a patients took place on the ward and most are for post-operative anaemia. Although our intervention impacted minimally on consent documentation in the medical notes, we did see a 21% improvement in the consent documented on the blood forms itself with a post-intervention reduction in unfilled forms by 31%. This corresponded to a slight improvement in the number of transfusion consent stickers in notes by 8%. In terms of the patient information leaflets given out, despite a 15% improvement in number of patients given leaflets, the unavailability of the leaflets on wards remained an issue.

CONCLUSIONS: Although our intervention helped addressing the issue of consent documentation for blood transfusion to colleagues, there is still room for improvement, especially with regards to availability of patient information leaflets.

REFERENCES:

1. Al-Riyami AZ, Al-Ghafri N, Zia F, Al-Huneini M, Al-Rawas AH, Al-Kindi S, Jose S, Al-Khabori M, Al-Sabti H, et al. First Implementation of Transfusion Consent Policy in Oman: Audit of compliance from

a tertiary care university hospital. Sultan Qaboos Univ Med J. 2016; 16(3): . https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4996290/ (accessed 28 September 2019).
2. Friedman M, Arja W, Batra R, Daniel S, Hoehn D, Paniz AM, et al. Informed Consent for Blood Transfusion: What Do Medicine Residents Tell? What Do Patients Understand?. American Journal of Clinical Pathology 2012; 138(4): . https://academic.oup.com/ajcp/article/138/4/559/1760948/ (accessed 28 September 2019).

Incidence of post-operative VTE after colorectal surgery in those without post-discharge thromboprophylaxis

Dr Zoe Cait Rooke, Dr Georgios Kourounis, Miss Lisa Moyes, Miss Helen Dorrance, Miss Mahua Chakrabarti

University of Glasgow

INTRODUCTION: The incidence of post-operative VTE following colorectal surgery in the UK is reported be-tween 1.6-2.3% [1,2]. As part of post-operative VTE prevention, guidelines by The National Institute for Clinical Excellence (NICE) advice thrombophylaxis is continued for a period of 28 days after cancer surgery of the abdomen and a minimum of 7 days for other cases [3]. Scottish guidance differs, with the Scottish Intercollegiate Guidelines Network (SIGN) rec-ommending stopping thromboprophylaxis upon discharge following any major abdominal surgery [4].
Our aim was to investigate the incidence of post-operative venous thromboembolism (VTE) among patients who underwent colorectal surgery at our hospital in Glasgow under an 'Enhanced Recovery After Surgery' protocol, with thromboprophylaxis stopped on dis-charge regardless of diagnosis.

PATIENTS AND METHODS: A prospectively collected database of all elective colorectal operations performed between March 2016 and December 2018 was retrospectively interrogated. Electronic patient notes were reviewed for any evidence of imaging investigations for VTE (computed topography pulmonary angiography (CTPA) or doppler ultrasound scan (USS). In those cases where im-aging investigation for VTE had been performed and was positive, the time between sur-gery and a positive scan was determined.

RESULTS: 602 patients had colorectal surgery in the 46 month period investigated. 522 (86.7%) of these patients had no subsequent imaging investigations performed for suspicion of VTE. 34 (5.6%) patients had imaging with a negative result, and 16 (2.7%) patients in all had a positive imaging investigation for VTE: 9 (1.5%) had a positive CTPA and 7 (1.2%) a positive Doppler USS. Of these patients, 2 (0.5%) VTE events only were reported in the first 28 days postoperatively (both DVTs), and a further 3 (0.5%) were reported between 28 days and 6 months post-operatively (1 DVT [0.16%] and 2 PEs [0.3%]).

CONCLUSIONS: Our cohort had a lower incidence of postoperative VTEs when adhering to SIGN guidance compared to reported large-scale study incidence rates in the UK. Further evidence is re-quired to compare our findings to those of patients managed under NICE guidelines.

REFERENCES:
1. A.J. Walker, J. West, T.R. Card, D.J. Humes, M.J. Grainge Variation in the risk of venous thromboembolism in people with colorectal cancer: a population-based cohort study from England. J Thromb Haemostasis, 12 (2014), pp. 641-649.
2.Y. El-Dhuwaib, C. Selvasekar, D.J. Corless, M. Deakin, J.P. Slavin. Venous thromboembolism following colorectal resection. Colorectal Dis, 19 (2017), pp. 385-394.

3. NICE, 2018. Venous thromboembolism in over 16s: reducing the risk of hospital-ac-quired deep vein thrombosis or pulmonary embolism. Available at: https://www.nice.org.uk/guidance/ng89/chapter/Recommendations#interventions-for-people-having-abdominal-thoracic-or-head-and-neck-surgery
4. SIGN, 2010. Prevention and management of venous thromboembolism. Available at: https://www.sign.ac.uk/assets/sign122.pdf

Clinical Audit of Actionable Reporting on Chest X-Ray for General Practice: are we achieving the key standards in radiology reporting?

Dr Yon Huang See, Dr Nicola Spence

University of Aberdeen (Affiliation: Aberdeen Royal Infirmary**)**

INTRODUCTION: Chest radiography (CXR) is one the most common radiological technique for the investigation of cardiorespiratory disease. However, most GPs are unable to review radiology imaging themselves mainly because of the lack of transmission of the imaging studies between IT systems and their workloads precludes the study of images. Therefore, the need for actionable reports are essential for them and their patients to ensure safe patient management. In accordance with the standard of actionable reporting, (1) the reports dictated for GPs should always address the clinical questions raised in the requesting forms. (2) When an abnormality is seen, a tentative or differential diagnosis should be provided taking into account of relevant prior studies and clinical information. (3) Further advice including investigations or specialists' referral should be recommended if appropriate. (4) All next step advice given should be appropriate.1 The goal of this audit was to evaluate the current local practice in CXR reporting against the recommended reporting standards with the target of 100% on all 4 standards mentioned above.

PATIENTS AND METHODS: Data were collected retrospectively on all GP CXR referral during March 2018 from ARI outpatient department. Patients referred by GP for CXR were identified using Radiology Information System (RIS) Database. Data regarding attendance number, CHI, site, referral letter, clinical question and formal report were collected.

RESULTS: A total of 426 CXR were identified. Of the 426 CXR, 45 CXR were abnormal and were included in the study, giving an average of 10.6% abnormal CXR incidence rate. All reports did answer the clinical questions with varying degree of certainty. 87% of abnormal CXR were given a tentative or differential diagnosis for the abnormality found. The diagnosis provided includes malignancy, pneumonia, atelectasis, pulmonary fibrosis, sarcoidosis etc. Of the remaining 13% abnormal CXR without a diagnosis, descriptive reports descriptive reports were given instead such as consolidation, opacity, effusion and pleural thickening. The next step advice was given in 73% of the report. This includes repeat or follow up examination, fast track and specialists' referral. The remaining 27% of abnormal CXR were not given any further advice. All advice given was appropriate and met the target of 100%.

CONCLUSIONS: Consolidation or opacity can be misinterpreted if ones could not see the imaging themselves hence the need for actionable reports. Current practice of CXR reporting falls short of recommended standard and requires improvement. Action plans include present and feedback via department audit meeting, circulate findings with reporting consultants and template for reporting. Re-audit to be performed 6 months after implementation of change.

REFERENCES:
1. The Royal College of Radiologists. Standards for interpretation and reporting of imaging investigations, second edition. London: The Royal College of Radiologists; 2018.
2. Caroline R, Neelam Dugar. Actionable reporting. The Royal College of Radiologists; 2018. Available from: https://www.rcr.ac.uk/audit/actionable-reporting

Operation Note Audit: Post Operative Instructions in General Surgery

Matthew Sikorski, Brigid Aherne

INTRODUCTION: Operation notes are a mandatory part of a patient's records. It functions also as a medico-legal document, and is essential for delivering safe patient care by functioning as a communication medium between theatre and ward (1). The Royal College of Surgeons of England Operation Note Guidelines (2,3) are used as a checklist for Operation Note creation. Since these guidelines are applicable to all surgical specialties they do not include specific post-operative instruction recommendations. The aim of our audit was to review operation notes in General Surgery, in Aberdeen Royal Infirmary, and to assess their compliance to the Royal College of Surgeons Operation Note Guidelines. Furthermore, we wished to assess what post-operative instructions may be beneficial to include in the operation note. The aim of creating post-operative instructions specific for General Surgery would be to help deliver safe and appropriate patient care. This would allow for better communication, and thus improving the confidence of the junior doctor and nurses alike when delivering this care.

PATIENTS AND METHODS: We completed an audit of 100 General Surgery Operation Notes, including both emergency and elective surgeries. We carried out a survey for foundation doctors working in the General Surgery department to ascertain which specific post operative instructions they would find beneficial if included in the post-operative instructions. We reviewed 40 of our original operation notes to assess if these post operative instructions were being recorded routinely in the Operation Notes.

RESULTS: Post-operative instructions which doctors felt would improve the delivery of safe patient care were not routinely included in the Operation notes. This information was presented at the General Surgery Department meeting, where it was agreed that guidelines for post-operative instructions be created and included in the Operation Note template.
We subsequently developed and introduced these guidelines.
We re-audited 40 Operation notes to assess the Royal College Of Surgeons guidelines compliance and the post-operative instruction guideline implementation.

CONCLUSIONS: On completion of this audit cycle we have generated a Post-Operative Instruction template for General Surgery Operation Notes in Aberdeen Royal Infirmary. This introduction is done with the aim to improve the delivery of safe patient care, particularly in the post-operative period.

REFERENCES:
(1) Theivendran K, Hassan S, I Clark D "Improving the quality of operative notes by implementing a new electronic template for upper limb surgery at the Royal Derby Hospital." BMJ Open Quality 2016;5:u208727.w3498. doi: 10.1136/bmjquality.u208727.w3498
(2) Royal College of Surgeons England Operation Note Guidelines (link: https://www.rcseng.ac.uk/standards-and-research/gsp/domain-1/1-3-record-your-work-clearly-accurately-and-legibly/)
(3) Hoggett et al. "How to write an Operation Note" BMJ 2017; 356 doi: https://doi.org/10.1136/bmj.j355 (Published 25 January 2017)

Quality of antibiotic prescribing in general surgery, Raigmore Hospital

Krystalina Y T Sim, Hannah Sellars, Alan Grant

INTRODUCTION: Antimicrobial resistance is an important patient-safety and public health issue. An antimicrobial stewardship programme under the title 'Start Smart – Then Focus' was initiated, aiming to ensure patients are given the best chance of having their infection effectively treated, while minimising the risk of adverse events and antimicrobial resistance.1 This re-audit was developed to assess appropriate antibiotic prescribing against the 'Start Smart— Then Focus' guidelines, with the set targets guided by RCP Ireland SMART and from previous audits.

PATIENTS AND METHODS: This was a point prevalence survey of antibiotic prescribing. Population included were all upper gastrointestinal and colorectal patients in surgical receiving, elective general surgery ward and surgical high dependency unit (SHDU), consistent with previous audits. Data was collected over three randomly selected weekdays.
This audit measured the compliance of prescribers to the following guidelines:
1. Documentation of antibiotic indication
2. Antibiotic choice in line with local guidelines and if not, any reason for deviation documented
3. Review of intravenous (IV) antibiotics within 48 hours
4. Documentation of duration of oral antibiotics in medical notes or charts
5. Correct step down from IV to oral antibiotics

RESULTS: Results showed that prescribers had 100% compliance for choice of antibiotics and correct stepdown from IV to oral. Prescribers had reached the target of 60% in reviewing antibiotics every 48 hours. The group was however, lacking in their compliance for documentation of antibiotic indication and duration. In comparison to previous audit conducted 6 months ago, compliance to most guidelines had generally improved.

CONCLUSIONS: Applying the principles of 'Start Smart—Then Focus' to prescribing practice can ensure antibiotics are used effectively, while protecting this vital medical resource for the future. The overall compliance was satisfactory regarding choosing the right antibiotics, reviewing after 48 hours and correct oral stepdown, with more encouragement needed in documenting antibiotics indication and duration.

REFERENCES:
1. Ashiru-Oredope , Sharland M, Charani E, McNulty C, Cooke J; ARHAI Antimicrobial Stewardship Group. Improving the quality of antibiotic prescribing in the NHS by developing a new Antimicrobial Stewardship Programme: Start Smart--Then Focus. J Antimicrob Chemother. 2012 Jul;67 Suppl 1:i51-63.

Investigation of Pneumonia in the Elderly: are we getting 6 week follow-up chest x-rays?

Ali Syed

Western General Hospital, NHS Lothian

INTRODUCTION: The British Thoracic Society (BTS) recommends 4-6 week follow-up imaging for pneumonia in high risk patients (age > 50 or smokers) (1). Ongoing consolidation on chest x-ray (CXR) can indicate malignancy or persistent infection. One recent study has shown that 8% of

patients with follow-up CXR after pneumonia (as per BTS guidance) were eventually diagnosed with an underlying malignancy (2).
This audit aimed to assess adherence to these guidelines in the Medicine of the Elderly (MOE) Department at the Western General Hospital (WGH).

PATIENTS AND METHODS: A list of all patients admitted to the MOE Department at the WGH in the months of March and April 2019 was generated. Clinical notes and PACS for these patients were searched to identify all those with a clinical diagnosis of pneumonia and new consolidation on CXR. Patients were classified as high or low risk as per BTS guidance. PACS was searched again to see if appropriate follow-up imaging had been performed after 6 weeks. Data was collected about factors which made it more or less likely for follow-up imaging to be performed.

RESULTS: 252 patients were admitted to MOE in March and April 2019. 56 had a clinical diagnosis of pneumonia with new consolidation on CXR. All of these patients met BTS criteria for a follow-up CXR, but 17 of the 56 died before repeat CXR was due. There were 39 remaining patients.
Only 21 of the 39 (54%) had a repeat CXR at 6 weeks. 23 of the 39 patients were still hospital inpatients when their follow-up CXR was due. 20 of these 23 patients (87%) had a follow-up CXR. 16 of the 39 patients had been discharged before their follow-up CXR was due. Only 1 of these 16 patients (6%) had a follow-up CXR.

CONCLUSIONS: There is limited concordance with BTS guidelines for follow-up CXR in elderly patients diagnosed with pneumonia. New diagnosis of underlying malignancy may not change management in very frail patients, and reticence to request follow-up CXR may reflect this. Outpatient CXR is not necessarily a benign intervention in very frail patients (for example, may require transfer to hospital from nursing home by ambulance). This may explain why adherence to BTS guidance was much better for patients still in hospital (87%), than those who had been discharged (6%). Limited adherence to BTS guidelines on follow-up CXR may reflect the clinical complexity of MOE patients. Clinicians should be aware of guidance regarding follow-up CXR for pneumonia, but specific circumstances may mean that follow-up imaging is not warranted.

REFERENCES:
1. Lim WS, Baudouin SV, George RC, et al. BTS guidelines for the management of community acquired pneumonia in adults: update 2009 Thorax 2009;64:iii1-iii55.
2. Bryl B, Barlow E, Davies HP182 Follow up chest X-rays (CXR) after community acquired pneumonia (CAP): are they done and are they useful? Thorax 2018;73:A199-A200.

Driving advice given to stroke patients: improving adherence to national guidelines

Ali Syed, Sarah Keir

Western General Hospital, NHS Lothian

INTRODUCTION: Ischaemic and haemorrhagic strokes often leave patients with severe physical and perceptual deficits that mean they cannot drive safely (1). DVLA guidelines suggest that all patients refrain from driving for at least 1 month after a stroke, and if there is any residual deficit afterwards, they must stop driving, and inform the DVLA (2).
This quality improvement project aimed to ensure stroke inpatients at the Western General Hospital (WGH) were given driving advice, in concordance with DVLA guidance. All stroke patients should be asked whether they drive. If they do drive, they should be given appropriate driving advice.

PATIENTS AND METHODS: A baseline audit of driving advice given to stroke inpatients at the WGH was performed. Clinical notes of all patients discharged in April 2019 were analysed to assess whether driving status had been ascertained and if appropriate driving advice had been given.
A series of interventions to improve adherence to the guidelines was launched. A presentation was given at the weekly WGH Stroke MDT to educate staff about the guidelines. Posters were distributed around the department for the same purpose. The stroke occupational therapists agreed to insert driving status and advice into the template they use when assessing patients.
A 4-week repeat audit was conducted after the interventions to assess if adherence to the guidelines had improved.

RESULTS: Baseline Audit: Of the 16 patients discharged in April, 0 had non-driving status documented or were given driving advice (0%)
Audit after Interventions: Of the 14 patients discharged, 13 had non-driving status documented or were given driving advice (93%). This is a statistically significant improvement ($p<0.00001$)

CONCLUSIONS: Stroke inpatients at the WGH were initially given no driving advice, despite DVLA guidance. Using a multidisplinary approach involving junior doctors, consultants and occupational therapists, we were able to significantly increase adherence to the relevant guidelines, from 0% to 93%. This will improve patient and public safety by reducing the risk of dangerous road traffic accidents.

REFERENCES:
1. Akinwuntan, A. E., Feys, H., De Weerdt, W., Baten, G., Arno, P., & Kiekens, C. (2006). Prediction of Driving after Stroke: A Prospective Study. Neurorehabilitation and Neural Repair, 20(3), 417–423
2. UK Government. (2019). Stroke (cerebrovascular accident) and driving. [online] Available at: https://www.gov.uk/stroke-and-driving

Knowledge of Sepsis 6 Bundle among Foundation Year 1 doctors in their clinical practice (district hospital)

Dr Ker Shiong Tan, Mr John Wayman
Queens University Belfast

INTRODUCTION: Sepsis is an emergency. Sepsis 6 is an easy protocol and its early initiation can help to prevent further complications. So knowing sepsis 6 bundle and early initiation of sepsis 6 bundle are extremely important
This quality improvement project was aimed to ensure all Foundation Year 1 doctors in Cumberland Infirmary, Carlisle are compliant to the sepsis 6 bundle and to identify areas that need addressing

PATIENTS AND METHODS: 28 Foundation Year 1 doctors were randomly approached to fill out the sepsis 6 questionnaire in a single day. The contents of questionnaire were based on North Cumbria University Hospital Trust Guideline which includes what were the components of sepsis 6 bundle.

RESULTS: Only 67% (28 out of 42) Foundation Year 1 doctors participated in this quality improvement project. The audit showed an average of 82.1% (23 out of 28 FY1) answered the sepsis 6 questionnaire correctly. A re-audit took place 5 months later. Recommendations were implemented and the re-audit showed 100% (28 out of 28) of the same Foundation Year 1 doctors answered the sepsis 6 questionnaire correctly.

CONCLUSIONS: It is surprising that not all FY1 doctors answer the questionnaire correctly although so much emphasis was given on sepsis 6 bundle in medical school training. To raise awareness,

captivating sepsis 6 posters were distributed every ward in the hospital and sepsis 6 presentations were also included in junior doctors induction and teaching programmes.
It is also very encouraging to know all the FY1 doctors eventually answered all the questionnaire correctly in the re-audit after recommendations were implemented.

REFERENCES:
1) https://www.nice.org.uk/guidance/ng51
2) https://www.rcem.ac.uk/docs/Sepsis/Sepsis%20Toolkit.pdf

Creation of an undergraduate teaching tool to address the availability-accessibility paradigm in medical education.

Nikolaos Tzoumas, Toby Boote

The University of Edinburgh

INTRODUCTION: Over the last decade, medical education has experienced a dramatic increase in the availability of learning resources. In an increasingly pressured and temporally constrained environment [1], it is unclear what effects this expansion has had on undergraduate experiences. We sought to assess the opinions of senior medical students undertaking their ophthalmology placements on their online teaching material and to create tailored resources in order to improve medical education at our UK medical school.

PATIENTS AND METHODS: We retrospectively analysed undergraduate feedback spanning eleven clinical rotations through the NHS Lothian Ophthalmology department, from 2014–2019. This highlighted three key areas for the improvement of teaching resources: quality, utility and reliability. We assessed senior Edinburgh Medical School student perceptions of their online ophthalmology resources using a nonrandomised pretest-posttest design. Analysis of the data of our pretest questionnaire (n = 68) guided the creation of eight up-to-date, single-page core condition overviews mapped to the undergraduate curriculum and using hyperlinks to open-source clinical images and further content to facilitate use in both off- and online settings. We then trialled these resources on the same 68 undergraduates in the weeks leading up to their summative examinations and followed this up with a posttest questionnaire (n = 47; 31% attrition rate).

RESULTS: In their cumulative feedback spanning five years, senior medical students highlighted the need for high quality, practical, and up-to-date resources focused on their immediate learning needs. After the implementation of our teaching tool, the overall proportion of senior medical students who rated the ophthalmology educational resources as high quality or very high quality increased from 25 to 96%. The overall proportion of senior medical students who felt that the ophthalmology resources were very helpful or extremely helpful in their current exam revisions increased from 16 to 69%. The overall proportion of senior medical students who felt that they were very likely or extremely likely to use the ophthalmology resources to revise for their next examinations increased from 36 to 94%.

CONCLUSIONS: As medical schools in the UK continue to rapidly expand their educational resources, the importance of accessible and interconnected knowledge to enhance user experience and patient safety becomes ever more pertinent. Our teaching intervention brought together information from disparate sources within the technological milieu of modern medical education. Our preliminary results translate to immediate improvements in the perceived quality, utility and reliability of senior medical student's teaching resources at our University. Formal implementation of our teaching

resources in the curriculum will allow us to see whether this intervention contributes to sustained benefits in educational performance and clinical practice.

REFERENCES:
1. Young JQ, Van Merrienboer J, Durning S, Ten Cate O. Cognitive load theory: implications for medical education: AMEE Guide No. 86. Medical teacher. 2014 May 1;36(5):371-84.

Post-operative outcomes of pre-operative biliary drainage in pancreatic cancer patients

Vivek Vaidya, Anisa Kushairi, Nick Moody, Alfred Adiamah, Dhanwant Gomez

Nottingham Digestive Diseases Centre and National Institute for Health Research (NIHR) Nottingham Biomedical Research Centre, Nottingham University Hospitals NHS Trust and University of Nottingham, Queen's Medical Centre

INTRODUCTION: Pre-operative biliary drainage (endoscopic retrograde cholangio-pancreatography or percutaneous transhepatic cholangiography) is often a helpful bridge to surgery in pancreatic cancer patients with hyperbilirubinaemia. However, biliary drainage often complicates pancreaticoduodenectomy with national guidance suggesting avoidance in patients who are fit for curative surgery [1]. We performed a retrospective review of patients with pancreatic cancer who underwent surgery with a curative intent to investigate impact of pre-operative biliary drainage on outcomes.

PATIENTS AND METHODS: This was a retrospective review of a prospectively collected database on all patients who underwent surgery for pancreatic cancer in a single tertiary centre from 2014-2018. Patients were divided into those who underwent biliary drainage and those who did not. Information collected included demographic data, biochemistry results and post-operative course. The main outcomes were post-operative complications, length of stay and mortality. Categorical data was analysed using logistic regression while continuous data was analysed using one-way ANOVA on the STATA/SE 15.0 program.

RESULTS: A total of 113 met inclusion criteria. There was an equal proportion of male and female patients with a mean age of 64years. The mean Charlson comorbidity index was 4.7 and mean ASA grade was 1.8. Seventy-eight (69%) patients underwent biliary drainage. The mean serum bilirubin level was 127. Biliary drainage was associated with a significant increase in intra-operative blood loss (P=0.005). However, there was no significant difference in other complications, mortality or length of stay.

CONCLUSIONS: In spite of national guidance, two-thirds of patients who undergo surgery for pancreatic cancer undergo pre-operative biliary drainage. There is a significant increase of intra-operative blood loss in patients who had biliary drainage. Apart from the risk of bleeding, pre-operative biliary drainage was not associated with other post-operative complications, prolonged length of stay or mortality.

REFERENCES:
1) https://www.nice.org.uk/guidance/ng85/chapter/Recommendations#relieving-biliary-and-duodenal-obstruction

Is SIADH or CSW the most common cause of hyponatraemia in traumatic brain injury? A systematic review.

Sara Venturini[1], Pragnesh Bhatt[1], Roy L Soiza[1,2]

1.Aberdeen Royal Infirmary 2. Ageing Clinical and Experimental Research (ACER), University of Aberdeen

INTRODUCTION: Hyponatraemia is the commonest electrolyte imbalance in hospitalised patients, with high incidence after traumatic brain injury (TBI). Two common causes are syndrome of inappropriate antidiuretic hormone (SIADH) and cerebral salt wasting (CSW). Differentiating them is important as their treatments are diametrically opposed. The aim of this review was to investigate the prevalence of SIADH and CSW after TBI.

PATIENTS AND METHODS: MEDLINE and EMBASE databases (1950-December 2018) were searched for observational studies of hyponatraemia in TBI. Review articles, case reports, selected case series were excluded. An 11-point quality assessment tool was developed to assess risk of bias. Screening was performed by two independent assessors. Studies were included in the meta-analysis if they provided data on the incidence of hyponatraemia and its causes in TBI patients.

RESULTS: Screening of 1887 abstracts revealed 49 articles meeting the criteria for full-text review. Twenty-two studies (5277 participants) met all inclusion criteria. Quality scores varied from one (worst) to eight (best), median score 4 [IQR 2.75, 6]. Eleven studies were included in meta-analysis, including 245 cases of hyponatraemia among 1411 TBI patients (prevalence 17.4%). The prevalence of SIADH was 28.6% (95%CI 23.1% - 34.0%, range 0-100%) and of CSW was 29.0% (95%CI 23.5% - 34.5%, range 0-100%).

CONCLUSIONS: This is the first systematic review and meta-analysis of the aetiology of hyponatraemia after TBI suggests SIADH and CSW are equally prevalent. However, the number of studies identified was small, study quality was generally poor, and there was extreme variability between individual studies, such that our results must be interpreted cautiously.

Fracture risk assessment and bisphosphonate prescription in patients on long-term high-dose prednisolone in a local general practice: A closed loop audit cycle

Andrel Wai Hong Yoong

University of Exeter

INTRODUCTION: In the UK, an estimated of 1% of the adult population is taking oral glucocorticoid and this figure rises to 2.4% in the 70-79 years age group.[1] Glucocorticoid use is associated with an increased risk of fragility fracture despite early initiation of treatment. Therefore, the National Institute for Health and Care Excellence (NICE) has provided guidelines to ensure high-risk patients are assessed for their fracture risk and subsequently prescribed bisphosphonate if required.[2] Currently, there are minimal reports on this subject in primary care. Therefore, a closed loop audit was performed at a local general practice after implementing interventions which address initial poor adherence. The aim of this audit is to evaluate the total fracture risk assessment completed and subsequent bisphosphonate prescription in patients taking long-term high-dose prednisolone.

PATIENTS AND METHODS: Data were obtained retrospectively by reviewing patients' notes on SystmOne. 15 patients who were on 7.5mg or more of prednisolone for three months or longer

within a three-month period were included. Prednisolone was selected because it is commonly used within patients in the surgery. Findings were analysed and interventions were implemented to improve adherence. This included producing reports for doctors, awareness presentations during weekly practice meetings and identifying and reviewing patients who were missed prior to the implementation of interventions. A re-audit was performed three months post-intervention on 11 patients within a three-month period using similar parameters.

RESULTS: Re-audit post-intervention revealed improvement in the total fracture risk assessment completed (53% to 73%). 62% of the patients assessed post-intervention were subsequently prescribed bisphosphonate. This improvement could potentially reduce the risk of fragility fractures which can be costly and difficult to treat.

CONCLUSIONS: All women aged under 65 years and men aged under 75 years taking more than 7.5mg of prednisolone for three months or longer should be considered for fracture risk assessment and subsequently started on bisphosphonates if required. Further studies can be done to investigate the compliance of fracture risk assessment and bisphosphonates prescription in patients taking all types of glucocorticoids for long-term.

REFERENCES:

1. Royal College of Physicians. Glucocorticoid-induced osteoporosis: Guidelines for prevention and treatment [Internet]. London: ROYAL COLLEGE OF PHYSICIANS OF LONDON; 2002 p. 7-8. Available from: https://cdn.shopify.com/s/files/1/0924/4392/files/glucocorticoid-induced-osteoporosis-guideline.pdf?2801907981964551469
2. Osteoporosis: assessing the risk of fragility fracture | Guidance and guidelines | NICE +[Internet]. Nice.org.uk. 2018 [cited 21 October 2018]. Available from: https://www.nice.org.uk/guidance/cg146/chapter/1-Guidance