



# WJMER

World Journal of Medical Education and Research

*An Official Publication of the Education and Research Division of Doctors Academy*

## ***Highlight: Abstracts from the 4<sup>th</sup> International Academic and Research Conference 2014, Manchester, UK***



The Anatomy and Pathogenesis of  
Tendinous Interconnection between Flexor  
Tendons in the Musician's Hand

The First National Undergraduate  
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Report

Synchronous Colorectal Cancers: A Case  
Report and Review of Literature.

## Introduction

The World Journal of Medical Education and Research (WJMER) (ISSN 2052-1715) is an online publication of the Doctors Academy Group of Educational Establishments. Published on a quarterly basis, the aim of the journal is to promote academia and research amongst members of the multi-disciplinary healthcare team including doctors, dentists, scientists, and students of these specialties from around the world. The principal objective of this journal is to encourage the aforementioned, from developing countries in particular, to publish their work. The journal intends to promote the healthy transfer of knowledge, opinions and expertise between those who have the benefit of cutting edge technology and those who need to innovate within their resource constraints. It is our hope that this will help to develop medical knowledge and to provide optimal clinical care in different settings. We envisage an incessant stream of information flowing along the channels that WJMER will create and that a surfeit of ideas will be gleaned from this process. We look forward to sharing these experiences with our readers in our editions. We are honoured to welcome you to WJMER.

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## Oral Presentations

### *Category: Clinical and Basic Science Research*

#### **OCRL1 INTERACTS WITH CD2AP AND IS EXPRESSED IN HUMAN PODOCYTES.**

Kirkwood-Wilson R\*, Hamidi H, Lowe M, Lennon R  
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**Introduction:** Mutation of the inositol polyphosphate 5-phosphatase, OCRL1, causes the X-linked disorder oculocerebrorenal syndrome of Lowe (Lowe syndrome), characterised by eye, brain and kidney defects. The renal phenotype comprises a proximal tubulopathy characterised by low molecular weight proteinuria; additionally, a subset of patients have been found to have glomerulosclerosis on renal biopsy. We therefore hypothesised that OCRL1 plays an important role in podocyte function, possibly in the maintenance of the slit-diaphragm, which is a crucial component of the glomerular filtration barrier. As a first step to investigate this hypothesis we investigated OCRL1 expression and its molecular interactions in human podocytes.

**Methods:** Using wild-type human podocytes (ref Saleem, MA et al 2002), we performed immunoblotting, immunoprecipitation, protein pull-down experiments and immunocytochemistry to characterise expression, interaction and localisation of OCRL1. In addition we reviewed a renal biopsy from a patient with Lowe syndrome and renal dysfunction.

**Results:** We found that OCRL1 is expressed in human podocytes, as expected, and went on to demonstrate an interaction with CD2AP, which likely occurs indirectly via IPIP27A, a key regulator of endocytic traffic. Within podocytes, both OCRL1 and CD2AP co-localise with components of the early endocytic pathway, providing evidence that OCRL1 may function, in a protein complex with CD2AP and IPIP27A, to regulate these pathways within the podocyte in vitro. In addition, we found evidence of glomerular pathology in a patient with Lowe syndrome.

**Discussion:** Our findings suggest that OCRL1 may have a role in endocytic trafficking in podocytes in addition to renal tubular cells and future studies will focus on defining this functional role. In parallel, further investigation of patients with Lowe syndrome will help to determine whether they are at risk of developing glomerular dysfunction.

#### **POLYCYSTIC OVARY SYNDROME IN FIRST VERSUS SECOND GENERATION ASIAN WOMEN; A COMPARATIVE ANALYSIS.**

Ribbons H.A\*, Karasu T, Lashen H  
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What are the phenotypical differences between first and second generations Asian women with Polycystic Ovary Syndrome (PCOS)? First and second generation Asian women differ with regards to age of onset of symptoms, presenting complaint and SHBG levels. There have been no published studies assessing if differences exist between the first and second generations of Asian women in the UK. This is a retrospective cohort study of 144 patients to examine the differences between first (102) and second (42) generations of Asian PCOS women in the UK. These women are from the Indian subcontinent, suffering from PCOS (Rotterdam Criteria). Several parameters were compared between the two groups. The first and second generation Asian women were identified and compared with each other. In this Asian population; the second generation patients presented at an earlier age ( $p=0.027$ ) than first generation women. Significantly more first generation patients presented with infertility ( $p=0.001$ ) while significantly more second generation patients presented with PCOS related symptoms ( $p=0.001$ ). There are significantly higher levels of SHBG in second generation patients ( $p=0.022$ ). The study identifies statistically significant differences between first and second generation Asian women suffering from PCOS.

## PROGRESS TOWARDS GENETIC MANIPULATION OF MICROSPORIDIANS USING CELL FREE CULTURE AND LASER PERMEABILISATION TECHNIQUES.

Filipescu T\*

University of St Andrews, United Kingdom

**Introduction:** Microsporidians are obligate intracellular parasites affecting immunocompromised patients. They are genetically reduced organisms which have lost a number of metabolic pathways and steal host ATP energy in order to complete a complicated life cycle. Our project's aim was to investigate methods for reversible permeabilisation of intracellular vegetative stages of microsporidia for purposes of genetic manipulation. In current literature there are no reports of successful microsporidian permeabilisation experiments.

**Laser poration:** Rabbit kidney cells infected with *T. hominis* microsporidia have been covered with propidium iodide fluorescent dye. Using an inverted microscope, a laser beam has been focused on the desired infected cell. The membranes of the host cell and the parasite were successively perforated to ensure parasite viability and dye diffusion. **Cell free culture:** *T. hominis* infected rabbit kidney cells were broken open and cultured in a mixture containing cell cytosol and an ATP regenerating system. Cells were fixed and embedded for electron microscopy.

**Results:** Using laser poration, there was good permeabilisation of the host and parasite cells but the survival rate was low. Using cell free culture, the EM investigations showed the presence of viable parasites in the synthetic environment.

**Conclusions:** The cell free culture and synthetic environment use open up the possibility of genetic manipulation of intracellular parasites using standard transfection reagents that are currently used in mammalian cells. This technique can be adapted for other organisms, including malarial parasites. NB – Please do NOT publish this abstract in any journal for data protection purposes.

## POLYAMINE CONJUGATES - A NEW MEANS OF ANTICANCER DRUG DELIVERY.

Welsh S\*

University of Aberdeen, United Kingdom

**Background:** Polyamines (putrescine, spermine and spermidine) are ubiquitously expressed polycationic molecules recognised for their essential role in cell growth. Intracellular polyamine concentrations are maintained by the dynamic interaction between *de novo* biosynthesis and uptake of preformed polyamines from extracellular sources via a polyamine transport system (PTS). A variety of proliferating cancer cells have demonstrated disrupted polyamine metabolism and pathophysiologically elevated intracellular concentrations for which PTS hyperactivity has been recognised as the primary cause. Despite much research the PTS remains poorly understood, however, it is recognized for its poor specificity which has led to its targeting in the development of novel targeted anticancer therapies. It may be possible to exploit the accelerated PTS demonstrated selectively in proliferating cancer cells with polyamine-cytotoxic conjugates, providing a Trojan-horse approach of bringing cytotoxics into cancerous cells.

**Method:** The cytotoxicity of three naphthalene diimide-polyamine conjugates (CM3, CM32, CM52) against pancreatic carcinoma cell line, PANC1, was investigated using MTT assays. Thereafter, the contributing role of the PTS in conjugate uptake was assessed indirectly by pre-treating cells with difluoromethylornithine (DFMO). DFMO is a potent irreversible suicide inhibitor of key polyamine biosynthetic enzyme, ornithine decarboxylase (ODC), resulting in polyamine depletion and subsequent accelerations of any pre-existing PTS hyperactivity. This would theoretically increase conjugate uptake, resulting in an enhanced conjugate cytotoxicity profile, provided the conjugate is recognised by the PTS. Cell protein and polyamine content was quantified with Lowry assay and liquid chromatography mass spectrometry respectively.

**Results:** Dose-dependent cytotoxicity profiles were established with mean half inhibitory (IC<sub>50</sub>) concentrations ranging from 5.17(±2.02) to 15.50(±3.28) µg/ml (values expressed as mean±standard deviation

(n=3)). DFMO pre-treatment did not significantly lower cytotoxicity and polyamine studies revealed incomplete polyamine depletion.

**Concentration:** Incomplete polyamine depletion undermines the ability to determine the role of the PTS in conjugate uptake although conjugates do demonstrate promising potency warranting further investigation.

#### **VARICOSE VEINS AS MARKERS FOR ARV COMPLIANCE IN HIV PATIENTS AN IMPLICATIONS FOR RESOURCE POOR COUNTRIES - A RANDOMISED OBSERVATIONAL STUDY.**

Lemon TI\*  
York Hospital, York

**Aims:** To establish the prevalence of chronic venous insufficiency in HIV/AIDS patients. To investigate links between ARVs, chronic venous insufficiency and disease severity.

**Methods:** During an HIV/AIDS clinic in Uganda, 127 people with laboratory diagnosed HIV/AIDS were examined and interviewed for signs and symptoms of chronic venous insufficiency. Medication history and CD4 counts were recorded. Patients with unconfirmed HIV/AIDS, not currently on ARVs or with other risk factors for chronic venous insufficiency were excluded. Ethics approval was gained from the governing hospital.

**Results:** Of the 127 identified, 115 (91%) patients were included. These patients had a mean age of 38 years and were 82 (71%) female. The mean length of infection was 65 months. The mean length of ARV treatment was 47 months. 104 (90%) patients had a history of Aspen combination therapy. 76% of patients had varicose veins. This was strongly correlated to low CD4 count and previous/current use of ARV combinations, particularly Zidovudine. There was some correlation between a lower CD4 and larger varicose veins. 111 (97%) patients described symptoms of some degree of venous insufficiency.

**Conclusions:** This study, the largest of its kind, shows patients with low CD4 and ARV therapy have a tendency to acquire chronic venous insufficiency. This has potential for disease and compliance monitoring in resource poor settings. It also highlights the importance of venous management in HIV/AIDS patients. Further work is needed to identify the exact cause for the varicose vein appearance. Either way, these findings may have an important impact on global health and HIV/AIDS management.

#### **CROSSTALK BETWEEN C5a AND FATTY ACIDS IN MONOCYTES.**

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C5a is the most effective anaphylactic agent generated after complement activation. It initiates production of inflammatory cytokines and facilitates swelling and infiltration of immune cells into the affected tissue. In obese subjects, up to 40% of the adipose tissue can be made up of macrophages which become associated with inflammation. Certain fatty acids (FA) and adipokines (produced by adipocytes) can interact with these macrophages, modulating the inflammation. This exploratory project aims to investigate the effects, in an in vitro model, of saturated and omega-3 FA on the C5a and LPS induced activation of macrophages. Two mouse macrophage cell lines (RAW264.7 and J774.2) were used. TNF $\alpha$  secretion, as tested by ELISA, was used as a measure of activation. Changes in C5aR expression were analysed by western blotting and flow cytometry. Immediate activation events of the C5aR were assessed using Fura-2 calcium indicator. RAW264.7 and J774.2 mouse macrophages respond to C5a and LPS stimulation with an increase in TNF $\alpha$  secretion. C5a and LPS induced TNF $\alpha$  secretion was down-regulated by the unsaturated FA eicosapentaenoic acid (dose dependently) but had no down-regulatory effect on expression of C5aR, or calcium signalling ability of the C5aR. This project presents novel finding on the inhibitory effect of EPA on C5a mediated inflammation. The crosstalk between these mediators that occurs in vivo is likely to be more complex than can be replicated in this study. Modulation of inflammation-associated pathologies by EPA may lead to development of novel therapeutics.

## MEGALOBlastic ANEMIA – AN INDICATOR TO DO PAP TEST?

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**Background:** Aberrant DNA methylation is a recognized feature of human cancers, folate is directly involved in DNA methylation via one-carbon metabolism. HPV targets the DNA to cause cervical pathology. Due to this common link between folate and HPV, this study aims at finding whether there is any co-relation between Megaloblastic anemia and cervical pathology. The objective was to compare and study the cervical cytomorphology between the two groups. If significant co-relation is obtained, women megaloblastic anemia could be advised to do Pap test regularly for early detection of cervical pathology and future aversion of complications.

### Methods:

Type of study: Case-Control study.

Study Population: 62

Study group: Female patients diagnosed as megaloblastic anemia on Bone marrow aspiration in the age group of 25-60 years of age. (n=20) OR MCV > 100 fl on CBC.

Control group: Non-anemic (hemoglobin above 12g/dl) (n=42)

**Exclusion criteria:** ANC/unmarried women.

### Results:

- The pap smears of 8 cases and 41 controls were NILM
- 8 cases were reported as ASCUS.
- 4 cases showed inflammatory atrophic smear pattern. (Age > 50 years).
- No case of HSIL was seen.
- 1 “suspicious for malignancy” was reported from the control group.

### Conclusion:

- Megaloblastic Anemia itself is not an indicator to do Pap test but if the woman also presents with hematological derangement such as low RBC folate and severe anemia she could be advised to take Pap test in the future.
- Data obtained was not statistically significant as there was no significant difference in the two groups.
- A larger study over a longer period of time is necessary to confirm or to negate the hypothesis.

## MEASURING OUTCOME AFTER SUBARACHNOID HAEMORRHAGE; THE DEVELOPMENT OF A NEW SAH-SPECIFIC OUTCOME TOOL: THE SAHOT (SUBARACHNOID HAEMORRHAGE OUTCOME TOOL).

Mitchell S\*, Foulkes L, Bulters D, Pace A, Galea I  
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**Background:** Assessment of patient outcome post SAH is not standardized – at present; there is no outcome tool specific to subarachnoid haemorrhage. We aim to construct and validate a new questionnaire (SAHOT) to be utilized by health-care professionals, to assess patient outcome and clinical need, and for use in SAH research.

**Materials/methods patients:** SAH patients were recruited from neurovascular specialist nurse and neurosurgical clinics at Southampton General Hospital. Patient inclusion criteria were aneurysmal SAH (with any/no form of treatment) and fluency in English.

**Design:** Following a literature search, a multi-disciplinary team with frequent contact with SAH patients developed a preliminary set of points for this questionnaire, which was presented to a focus group of SAH patients on several occasions for input on usability, design, alteration of items and suggestion of additional items. The final 60 point tool has 4 sections – General Aspects of Daily Life, Physical Aspects, Cognitive



Aspects, and Behavioural/Psychological Aspects. The SAHOT was administered to patients and next-of-kin, together with Glasgow Outcome Score (Extended Version) and modified Rankin Scale.

**Results:** Over 9 months, 95 patients and 90 next-of-kin were interviewed by one medical student, at 3 months post-SAH, 6 months post-SAH, or both time points. Rasch analysis of the data is currently ongoing.

**Conclusions:** The SAHOT is the first attempt to develop a neurological patient-reported functional outcome tool specific for subarachnoid haemorrhage.

### THE DECLINE IN AGE AT MENARCHE AND ITS ASSOCIATION WITH BODY MASS INDEX IN SAUDI ARABIA.

Farhoud S\*, Foudah M, Hashim R, AlSukait S, Alshaman L, Abdulkader G  
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**Introduction:** Rationale Increasing rates of childhood obesity and rapid changes in socio-economic status in the Kingdom of Saudi Arabia resulted in a decline in age at menarche which contributes to a number of diseases affecting women's future health.

**Objectives:** To investigate the mean age at menarche in girls ages 9-16 in Riyadh, Saudi Arabia, and observe its relationship with their body mass index and other covariates.

**Methods:** A cross-sectional study was conducted on 364 students in both private and governmental schools in Riyadh, Saudi Arabia, during March 2013 Data on demographics, socioeconomic status, physical activity, diet, and age at menarche were collected using self-administered questionnaires distributed on students and their mothers Physical examinations were conducted to provide anthropometric measurements.

**Results:** A total of 304 students were included, with a mean age (SD) of 12 52(2 08), 165 (54 3%) of whom attained menarche Mean menarcheal age (SD) for the girls was 12 08 (1 28), and 13 13 (1 67) for their mothers, the difference between them was found to be significant ( $P < 0.001$ ) The mothers mean age at menarche was positively correlated with their daughters ( $r = 0.411$ ,  $P < 0.001$ ) There was no significant correlation between BMI and age at menarche ( $P > 0.05$ ) A significant difference was present in the mean age at menarche (SD) between governmental and private school students, 12 34 (1 19) and 11 59 (1 3) years, respectively ( $P < 0.001$ ).

**Recommendations:** The declining trend in age at menarche suggest that its modifiable influencing factors should be monitored and taken into account in strategies that aim to combat the potentially adverse.

### NOVEL VERSUS STANDARD PERCUTANEOUS VERTEBROPLASTY.

Soon WC\*, Mathew R, Timothy J  
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**Background:** Percutaneous vertebroplasty is a minimally invasive procedure that aims to treat vertebral compression fractures by reducing the affected patients' pain and immobility symptoms. Various methods have been developed over the years to improve the vertebroplasty procedure. The lack of control over the needle direction has led to the development of a steerable-tipped 'Osseon' needle which aims to provide the operator with better control over the direction of the delivery needle. No such study has been previously reported. Aim: To compare the radiological and clinical outcomes of unipediculate vertebroplasty using a novel steerable needle (Osseon Therapeutics, US) versus a standard straight needle (Stryker Interventional Spine, US).

**Methods:** 19 patients (36 levels of vertebrae) were operated on at the LGI between 1st Sep 2010 and 31st Mar 2011. Either the novel steerable needle (Osseon Therapeutics, US) or the conventional straight needle (Stryker International Spine, US) was used. Post-operative radiographs (AP) were used to calculate percentage of cement projection across the midline. Pre-and post-operative pain scores were used to evaluate clinical outcome. Mean values were analysed using the Student t test.

**Results:** Midline cement projection was significantly higher with the steerable needle (n=9, vertebrae=14, mean age 60 yrs) at 57.5% (0-100%) compared to 34.5% (0-81%) with the straight needle (n=10, vertebrae = 22, mean age 67 yrs) (p=0.046) Cement extravasation was higher with the steerable needle (44% versus 30%) but no clinical complications were reported in either group. Of the pain scores available, there was 100% improvement in the steerable needle group (n=3), compared to 33% improvement in the straight needle group (n=6).

**Conclusions:** Vertebroplasty with a novel steerable needle provides better radiological and clinical outcomes than with a standard straight needle. A larger, randomized multi-centre prospective trial would be invaluable in confirming these findings.

#### RETROSPECTIVE OUTCOME STUDY OF JOINT SYNCHRONOUS HEPATOBILIARY AND COLORECTAL RESECTION SURGERY.

Iqbal MH\*, Rizwan M  
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**Background:** Colorectal cancer (CRC) is one of the most common types of cancers, accounting for the 2nd highest mortality from all cancers in the UK. With thousands of patients presenting with metastatic colon cancer it is becoming a growing concern. Synchronous colorectal and hepatobiliary surgery is currently the only curative option available, however the question remains on the feasibility behind such an extensive procedure for patients to undergo, many who are close to the end stages of their life; is it acceptable to take the risk for such a procedure?

**Objective:** Determine the outcomes of patients who have undergone hepatic and colon resection and assessing its feasibility. Furthermore assess prognostic factors based on patient's age, gender, co-morbidities, ASA status, histology staging and type of procedure.

**Methods:** In this single-center study, we retrospectively analyzed patients with metastatic colon cancer within the past seven years and recorded their outcomes and complications.

**Results & Discussion:** We identified a total of 17 patients who had undergone this procedure synchronously. Out of these, 16 patients required this procedure for metastatic adenocarcinoma of colorectal origin. 71% (n=12) patients presented with a significant post-operative complication that increased hospital stay or significantly affected quality of life. There was a reoccurrence rate of liver (n=5) and rectal (n=1) of 38%, along with a mean survival of all patients of 20 months; further questioning the feasibility of this procedure. Other various complications were also reported with the commonest being Intra-abdominal fluid collections and one patient with anastomotic leak requiring urgent surgical intervention.

**Conclusions:** Although this is currently the only surgical procedure available, with results of 71% of patients presenting with complications, it is important to consider whether prolonging life for an average of 20 months is feasible to justify the cost and most importantly the patient's quality of life.

#### OSTEOARTHRITIC CARTILAGE CELLS AS A SOURCE FOR NEO-CARTILAGE PRODUCTION.

McRobbie H\*, Esa A, Caterson B, Duanice V  
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**Background:** Osteoarthritis affects over 8-million people in the UK. Alternative procedures to treat osteoarthritis by regenerating articular cartilage through tissue engineering are being explored. Osteoarthritic cartilage is characterised by the presence of cell clusters thought to originate from progenitor cells in an attempted repair. Isolation of chondroprogenitor cells depends on the identification of appropriate biomarkers.



**Materials and Methods:** Single cells and cell clusters from human osteoarthritic cartilage were isolated using dispase and collagenase digestion. These were separated by a cell filtration step and fixed at 8 different time points (Day 0 to Day 7), followed by immunohistochemical analysis with antibodies 3B3(-) and 7D4, CD105 and CD166.

**Results:** The modified dispase and collagenase procedure facilitated the isolation and separation of single cells and cell clusters, retaining an intact pericellular matrix. This maintained pericellular epitope expression and allowed immunohistochemical analysis of epitopes recognised by antibodies 3B3(-), 7D4, CD105 and CD166. Expression of all epitopes was present in single cells and cell clusters. Epitopes recognised by antibody 3B3(-) were initially expressed pericellularly, later becoming intracellular with a punctate pattern. Epitopes recognised by antibodies 7D4, CD105 and CD166 were located pericellularly. CD105 displayed bimodal labelling with a proportion of single and cluster cells staining at high intensities.

**Discussion and Conclusion:** These results suggest that osteoarthritic single cells and cell clusters may represent a population of mesenchymal stem cell-like progenitors which can be identified by monoclonal antibodies 3B3(-), 7D4, CD105 and CD166. The osteoarthritic origin of these cells represents an accessible, ethical source of progenitor cells for articular cartilage regeneration. In addition, our isolation technique sufficiently separated single cells and cell clusters, allowing direct comparison of the cell subpopulations and assessment of their progenitor potency. Further characterisation of chondroprogenitor cells and epitope expression will improve the understanding of their therapeutic role in osteoarthritic defect repair.

#### MEASURING DRUG-INDUCED MITOCHONDRIAL DYSFUNCTION AS A DETERMINANT OF CELL DEATH.

Zainab S\*

Liverpool University, United Kingdom

**Background:** Mitochondria are a frequent drug target and play a central role in human physiology being primarily responsible for the production of more than 90% of cellular ATP via oxidative phosphorylation (OXPHOS). A Pfizer study of 550 drugs revealed that 34 % of drugs displaying organ toxicity impaired mitochondrial function. Therefore testing for MD during early preclinical safety studies is crucial. However the current methods used are not ideal and account for the late detection of MD. Experiments performed in the Department of Pharmacology validated the glucose-galactose cell model devised by Marroquin for the detection of MD. A decline in the ATP levels of HepG2-galactose cells was seen following exposure to the positive controls, prior to evidence of cytotoxicity. It was subsequently hypothesised that early MD could also be detected in HepG2-glucose cells through measuring mitochondrial respiration.

**Methods:** The Oxygen Consumption Rate (OCR) and Extracellular Acidification Rate (ECAR) of HepG2-glucose cells was measured for 2 hours after treatment with a vehicle control, amiodarone, buspirone, nefazodone, troglitazone, tolcapone, CCCP, rotenone or antimycin. The Mitochondrial Membrane Depolarisation (MMD) of HepG2-glucose and HepG2-galactose drug-exposed cells was measured in a TMRE assay.

**Results:** Determining the changes in the OCR and ECAR of HepG2-glucose cells when exposed to test compounds provided an indication of mitochondrial function. Signs of early MD were evident and mechanisms of MD were deduced. Analysing the percentage change in TMRE Fluorescence of HepG2-glucose and HepG2-galactose drug-exposed cells provided an indication of MD, although added little mechanistic value.

**Conclusion:** The XF96 proved to be a novel high-throughput and highly sensitive method for the prediction of MD. This assay has great implications for drug development and clinical practice. The detection of early MD can serve as a 'window period' for drug withdrawal or therapeutic intervention before the development of potentially fatal organ toxicity.

## INDUCTION OF ANGIOGENESIS AND OSTEOGENESIS IN IMPACTION BONE ALLOGRAFTS.

Parker R\*  
Southampton General Hospital, United Kingdom

**Background:** Between 30-50% of joint replacement patients will require revision surgery, where bone augmentation will be necessary as prostheses wear out over time. The demographic challenges of an advancing aged population emphasise the need for innovative approaches to skeletal tissue reconstruction. Currently bone augmentation procedures in hip revision surgery, involve the impaction of allograft into femoral and acetabular defects. The problems associated with these techniques are recreating an interactive osteogenic and angiogenic environment which is essential for optimal bone growth and vessel formation within the graft.

**Aim:** This study investigated the potential of co-culturing vascular cells (endothelial) with Human Bone Marrow Stromal Cells (HBMSC) to enhance osteogenesis and angiogenesis of impacted allograft constructs for bone revision arthroplasty. The study will also look at the culture of vascular cells in a 3D gel (un-impacted) to compare osteogenic and angiogenic induction with that of the impacted allografts with co culture cells.

**Methods:** Bone allografts were seeded with either HBMSC, endothelial cells, or as a co-culture of both cell types, impacted and cultured for 7days in basal tissue culture medium (TCM). Similarly, these groups of cells were cultured within a gel (matrigel) scaffolds for 7 days. These were then analysed using histology and immunohistochemistry.

**Results:** Fluorescent cell viability demonstrated that the cells survived impaction and remained metabolically active. Alkaline phosphatase expression (early marker of osteogenesis) was elevated in the coculture impacted samples compared to the other groups. Alcian Blue (proteoglycans)/Sirius red (collagen) staining was shown to be increased in the co-culture and HBMSC group. Similarly, osteoid (un-mineralised organic extracellular matrix) determined by bone was shown to be in greater quantity in the co-culture and HBMSC samples using a Goldners Trichrome stain.

**Conclusion:** The results are indicative that HBMSC and HUVECS have the ability to survive impaction and enhance osteogenesis.

## ACUTE UPPER GASTROINTESTINAL BLEEDING IN PATIENTS WITH AND WITHOUT USING ANTICOAGULANT AND NON-STEROIDAL ANTI-INFLAMMATORY DRUG THERAPY.

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**Background:** Although conjoint use of NSAIDs and oral anticoagulants (OAC) may increase the risk of gastrointestinal tract bleeding, still many patients use them.

**Aims:** To identify patients who have upper gastrointestinal bleeding (UGIB) due to usage of OAC and NSAIDs; which OAC cause severe UGIB; to reveal any relation between severity of bleeding and the place of bleeding, being in Intensive Care Unit (ICU), longer hospitalization and exitus letalis.

**Methods:** Retrospective, prospective mixed cohort study (on-going) conducted in Riga Eastern Clinical University Hospital in 5-month time.

**Results:** Out of 81 patient, seven (8,6%) used OAC (2,5%- novel OAC, 6,5% -warfarin), three had bleeding stomach ulcer FIIC. Two (2,5%) had Mallory-Weiss syndrome, five (6,2%) had Dieulafoy's lesion, two used OAC ( $p = 0,057$ ). The most frequent bleeding site was duodenum - 48,1% ( $n=39$ ). From 81 patient, 21 used NSAIDs, 7 used Ibuprofen. Nine (33, 3%) patients with FIIB bleeding had used NSAIDs ( $p=0,028$ , Chi-Square Test). FIA patients had to stay in ICU longer than FIIB patients ( $n=27$ ,  $p=0,020$ , Mann-Whitney Test). There

was no statistically significant link between severity of bleeding, time spent in hospital and exitus letalis ( $p>0,05$ ).

**Discussion:** Including patients with hemorrhagic gastropathy is in study plan. With more patients, it will be possible to divide them in equal groups to see in which one UGIB prevalence is higher and which OAC causes more severe UGIB. The hope is to see how the in-patient treatment affects the severity of bleeding, time spent in the hospital and outcome.

**Conclusion:** Patients with severe bleeding (FIA) had to stay in ICU longer. Patients who used OAC had FIIC class bleeding and Dieulafoy's lesion. Patients who had used NSAIDs had FIIB bleeding class. No link between severity of bleeding, time spent in hospital and exitus letalis was found.

### SENILE SCLERAL PLAQUES REVISITED WITH ENHANCED DEPTH IMAGING ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY.

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**Introduction:** Senile scleral plaques are sharply demarcated greyish areas located anterior to the insertions of the horizontal rectus muscles and often contain calcifications. The incidence of calcified plaques has been reported to be up to 7% in radiological studies. The aim of this study was to characterize senile scleral plaques using enhanced depth imaging spectral domain anterior segment optical coherence tomography (AS-OCT). Methods Senile scleral plaques of 32 patients were imaged with a Spectralis AS-OCT. Standardized color monophotographs of senile scleral plaques were also obtained.

**Results:** Senile scleral plaques (SSP) were exquisitely located at the insertion sites of the horizontal recti muscles. The mean distance from the limbus was 2.24 mm for nasally located SSP and 3.22 mm for temporally located SSP. The mean horizontal diameter was 2274  $\mu\text{m}$  and the vertical diameter for the nasally located SSP was 3063  $\mu\text{m}$  and for the temporally located 3730  $\mu\text{m}$ . The SSP had an average surface area of 4.8 mm<sup>2</sup> nasally and 6.4 mm<sup>2</sup> temporally. The mean SSP thickness was 577  $\mu\text{m}$ .

**Conclusion:** Senile scleral plaques are a frequent finding in the elderly population. Using OCT with enhanced depth imaging we were able to image these plaques in vivo for the first time. Using OCT these plaques presented as non-reflective spaces at the insertion of the horizontal recti muscles, in keeping with previously published histology reports showing marked degeneration of collagen within the plaques.

### CUTANEOUS ADVERSE DRUG REACTIONS IN HOSPITALISED PATIENTS IN BENGHAZI, LIBYA.

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**Background:** Adverse drug reactions (ADRs) are a common occurrence in hospitalised patients, and one that all physicians will experience during their clinical practice. Few studies have examined the incidence and clinical presentations of cutaneous ADRs in hospitals in Libya.

**Methods:** Archival clinical and laboratory data on all inpatient dermatology consultations in a tertiary care hospital in Benghazi with a diagnosis of cutaneous adverse drug reaction between 1st January 2013 and the 30th June 2013 was retrospectively analysed.

**Results:** A total of 62 patients were diagnosed with cutaneous adverse drug reactions. Seven different clinical reaction patterns were noted, namely maculopapular rash (46.8%), drug exanthems (22.6%), fixed drug eruption (16.1%), urticaria/angioedema (6.5%), erythema multiforme minor (3.2%), generalised exanthematous pustulosis (3.2%), and toxic epidermal necrolysis (1.6%). The medications responsible for the

reactions included antimicrobials (51.6%), non-steroidal anti-inflammatory drugs (19.4%), anticonvulsants (12.9%), chemotherapeutic agents (6.5%), intravenous contrasts (6.5%), allopurinol (1.6%), and oral contraceptives (1.6%). The total number of patients admitted to the hospital in the study period was 26,183, therefore the total incidence of cutaneous ADRs was 0.24%.

**Conclusion:** Cutaneous ADRs are a common occurrence in hospitalised patients, and early identification of cutaneous ADRs and their putative medications are key in the management and prevention of more severe, and sometimes avoidable, drug reactions.

#### **PROOF OF PRINCIPLE: THE SUCCESSFUL AMPLIFICATION OF MICRORNAS AND THEIR POTENTIAL IN THE FUTURE OF PERSONALISED TREATMENTS.**

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**Background:** Micro-RNAs are small, non-coding RNA molecules that have recently been researched in clinical medicine as possible novel biomarkers for cancer to assist in tailoring treatments to individual patients. The aim of this study is to prove that micro-RNAs can be robustly extracted at a detectable level by qRT-PCR, using late-stage colorectal adenocarcinoma FFPE blocks, and observing any differences between the levels of micro-RNA extracted from different tissue types, such as between tumour and normal tissue, and between KRAS mutant and KRAS wild-type tissues, and the stability of stored micro-RNA was compared to that of cDNA.

**Methods:** hsa-miR-21 was chosen as the target micro-RNA for this study. Using ten anonymised FFPE adenocarcinoma blocks, total RNA was extracted and checked for contaminants using a spectrophotometer. The RNA was then reverse transcribed specifically for hsa-miR-21 to cDNA and stored at -20°C. The qRT-PCR was performed using a TaqMan® probe for hsa-miR-21, and the results were analysed using student t-tests at the 5% significance level on Microsoft Office Excel 2007. A synthetic micro-RNA-21 was used as a positive control.

**Results:** The qRT-PCR successfully detected hsa-miR-21 above the set  $\Delta R_n$  threshold (0.2) in 90% of samples. There were no significant differences found in the levels of hsa-miR-21 between tumour and normal samples ( $p=0.16$ ) and between KRAS mutant and KRAS wild-type samples ( $p=0.42$ ). It was found that micro-RNA degrades significantly when stored as RNA at -80°C compared to when it is stored as cDNA at -20°C ( $p=1.19 \times 10^{-13}$ ).

**Discussion and Conclusion:** This was a successful proof of principle study, showing that it is possible to extract hsa-miR-21 under diagnostic laboratory conditions from FFPE blocks. However, the results show that the methodology does not yet have enough integrity to produce reliable readings. For future considerations, the methodology should be improved upon.

#### **THE ANALYSIS OF THE DISCREPANCY OF CLINICAL AND PATHOANATOMICAL DIAGNOSES BASED ON THE OPERATIONAL AND SECTIONAL MATERIALS.**

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**Aims:** Analysis of the cases of discrepancy of clinical and pathoanatomical diagnoses by sectional and operational material based on materials of hospital of emergency care.

**Research problems:** 1. To define the categories of the discrepancy of clinical and pathoanatomical diagnoses; 2. To specify the causes of discrepancy of the diagnoses by sectional and operational material. Research methods: 1. Analysis of 7 cases of the discrepancy of clinical and pathoanatomical diagnoses by sectional material for 2013; 2. Analysis of 35 cases of the discrepancy of clinical and pathohistological diagnoses by operational material for 2012-2013.

**Relevance of research:** One of the indicators of effective activity of the medical institution is the percentage of discrepancy of clinical and pathoanatomical diagnoses, herewith collation of diagnoses carried out in three main headings:

- Underlying disease;
- Its major complications;
- Major comorbidity.

**Obtained results:** According to the hospital of emergency care in 2013 by sectional material revealed: 7 cases of discrepancy of clinical and pathoanatomical diagnoses by cerebral infarction from 97 cases of stroke. The age category: -Adulthood - 2 cases (36-60 years) -Advanced age - 3 (56-74 years) -Senile age- 2 (75-90 years). According to the hospital of emergency care for 2012-2013 by operational material revealed: 35 cases of discrepancy of clinical and pathohistological diagnoses from 21250 cases, which is equal to 0.16%. From 35 cases of operating-biopsy material were determined: - In 27 cases – tumours; - In 8 cases non-tumorous (inflammatory) diseases.

**Conclusions:** The analysis of the sectional and operational materials showed that the discrepancy of clinical and pathoanatomical diagnoses associated with objective factors such as severity of condition of the patients at the admission, short duration of hospital stay with age, and that demands from surgeons oncological alertness.

#### **HAEMATOPOIETIC STEM CELL TRANSPLANTATION MAY CURE THE IMMUNE DEFICIT ASSOCIATED WITH STAT-3 DEFICIENT HYPER-IgE SYNDROME.**

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**Background:** Hyper-IgE syndrome (HIES) resulting from STAT3 mutation is a rare autosomal dominant primary immunodeficiency. Presentation is often with a newborn pustular rash<sup>1</sup>. The disease is typified by recurrent infections, eczema, characteristic facies, failure of decudation, scoliosis, easily fractured bones, bronchiectasis, pneumatoceles, eosinophilia and a high IgE >2000IU/ml<sup>1</sup>. A report of negative results following haematopoietic stem cell transplantation (HSCT) for HIES in 2000<sup>2</sup> potentiated largely supportive treatment thereafter.

**Methods:** A retrospective review of 3 patients with STAT3 deficiency who have undergone HSCT.

**Results:** A 24-year-old woman who suffered from birth with recurrent infections and highly frequent hospitalisation, was transplanted 18 years ago. Despite 100% donor chimerism, the procedure was described as unsuccessful following IgE increase, but there has since been improvement. Infrequent hospital admissions, few infections and improvement of skin and lung function are all evident. IgE levels have since remained low. She no longer requires immunoglobulin support despite impaired IL17 production, which indicates incomplete Th17 reconstitution IFN- $\gamma$  and IL12 response and production are normal. A 22-year-old man suffered from childhood with frequent severe bronchopneumonia and bronchiectasis resulting in lobectomy, osteopenia causing pathological fractures, chronic dermatitis and repeated hospital admissions; negatively impacting development. Following transplant 9 years ago, he has 100% donor chimerism with low IgE, significant improvement in lung function, decreased infections and hospital admissions, despite impaired IL17 production. A 13-year-old patient was transplanted 1 year ago. Lung function has improved. Post-HSCT IL17 production is normal.

**Discussion:** Associated complications including lowered bone density, bony deformity and parenchymal lung abnormalities remain. These patients however, have improved immune function, sufficient to allow cessation of immunoglobulin therapy and reduce infections. Additionally, outcomes have permitted re-integration into academic, social and physical activities

**Conclusion:** HSCT for HIES may cure the underlying immune deficit, and should be considered for a select group of patients.

## THE EFFECT OF ECONOMIC DOWNTURNS ON MM IN PREGNANCIES WITH ABORTIVE OUTCOMES WORLDWIDE: 1981-2010

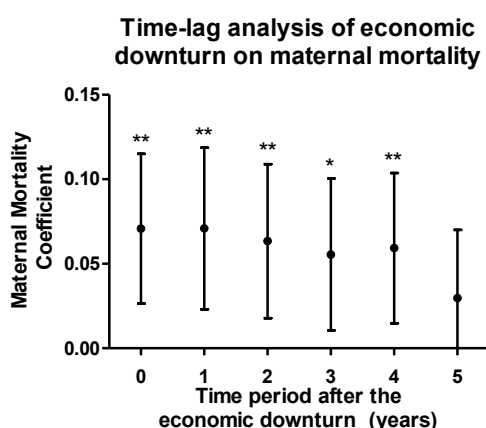
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**Background:** Maternal mortality remains a major health burden and efforts in reducing maternal mortality and morbidity have lagged behind other global health priorities. Millennium development goal 5 (MDG 5) has focussed on improving maternal health. Abortion related mortality occurs exclusively from complications of unsafe abortion; these include haemorrhage and infection. Currently, there is limited literature on the impact of macroeconomic fluctuations on maternal mortality. Our study evaluated the effects of economic downturns on maternal mortality in pregnancies with abortive outcomes worldwide.

**Methods:** Comparative country level data were obtained for countries over a 30 year period (1981-2010). Economic and population data were obtained from the World Bank and maternal mortality data were obtained from the World Health Organization database. An economic downturn was defined as an annual decline in GDP per capita. Multivariate regression models were used, controlling for country specific differences in healthcare, infrastructure, population size and demographic structure. Effects were evaluated using a dummy variable for economic downturns. Time lag analyses were performed to determine the effects 1-5 years after the downturns occurred.

**Results:** Data were available for 81 countries. Economic downturns were associated with a significant increase in maternal mortality rates from pregnancies with abortive outcomes (coefficient 0.0708,  $p < 0.01$ , CI: 0.0264, 0.1151) in comparison to non-recession years. The impact on maternal mortality was sustained for up to 4 years after economic downturns (year 1- coefficient 0.0709,  $p$  value 0.0037, CI: 0.0231, 0.1187; year 2- coefficient 0.0634,  $p$  value 0.0065, CI 0.0178, 0.1089; year 3- coefficient 0.0554,  $p$  value 0.0157, CI: 0.0105, 0.1004; year 4- coefficient 0.0593,  $p$  value 0.009, CI: 0.0148, 0.1037). The effects were still present when accounting for additional economic and infrastructure controls. However, the negative impact of a downturn on mortality was removed when controlling for hospital resources including number of physicians and hospital beds.

**Conclusions:** Economic downturns are significantly associated with increased maternal mortality which may occur through a variety of mechanisms such as changes in government health spending and the supply of healthcare resources. With unsafe abortion being one of the top three causes for maternal mortality, our study demonstrates that a global economic downturn may be one of the factors slowing down the reduction in the maternal mortality ratio, hindering the achievement of MDG 5.



### Time-lag analysis of economic downturn on maternal mortality.

Multivariate regression analysis was used to assess the relationship between maternal mortality and economic downturn. The maternal mortality coefficients and their corresponding confidence intervals are displayed for a time frame of up to 5 years after the downturn. \*\* $p < 0.01$ , \* $p < 0.05$

**NON-RENAL PARENCHYMAL HYPERTENSION: AN EMERGING PROBLEM IN TODAY'S CHILDREN.**

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**Background:** The prevalence of childhood hypertension is increasing in conjunction with obesity and sedentary lifestyles increasingly predominating westernised societies, it is thought that childhood hypertension is undergoing an epidemiological shift with non-renal parenchymal aetiologies becoming more prevalent. To investigate whether this holds true in the UK population we conducted a retrospective study assessing the aetiology of non-renal parenchymal hypertension in a tertiary paediatric centre.

**Methods:** Patients attending a nephrology clinic at the Royal Manchester's Children Hospital and its district general hospitals during 2012 were analysed. Patients with a confirmed diagnosis of pre-hypertension or hypertension with a non-renal parenchymal aetiology were categorised as essential, renovascular, cardiac, other vascular lesions, endocrine, metabolic or others. Age, gender, ethnicity and body mass index of the 7 groups were compared.

**Results:** 130 pre-hypertensive and hypertensive patients attended a nephrology clinic over the 1 year study period. Of the 130 patients: 38 (29.2%) had a non-renal parenchymal aetiology. Essential was the commonest aetiology (45.9%), followed by cardiac (16.2%), renovascular (16.2%), metabolic (8.1%), other vascular lesions (5.4%), endocrine (5.4%) and others (2.7%). Non-renal parenchymal HTN had a significantly higher proportion of overweight and obese patients than the renal parenchymal cohort ( $\chi^2 = 7.817$ ,  $p = 0.01$ ). Ethnic, age and gender differences were of no significance.

**Discussion:** Determining whether other non-renal parenchymal aetiologies have diverged from their past prevalence is essential for elucidating the developmental origins of HTN in today's adults. This study provides evidence of the changes between the past and present aetiologies.

**Conclusion:** In view of the obesity epidemic, non-renal parenchymal hypertension, specifically essential hypertension, is more prevalent in UK children and adolescents than previously reported. This emphasises the need for routine blood pressure measurements, implementation of preventive measures and early diagnosis of HTN to address this.

**CROSSWORDS, WORD SEARCH, AND WORD MATCHES AS USEFUL GAMES TO CONSOLIDATE THE RETENTION OF THE PRINCIPLES OF CARDIOPULMONARY RESUSCITATION.**

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**Background:** Studies show that the skills and knowledge related to cardiopulmonary resuscitation tend to deteriorate over time.

**Methods:** Two hundred sixty Italian medical students participating in a course of theoretical and practical BLSD were randomized into two groups of 130 people each. Before the start of the course and at the end of it, they completed a questionnaire consisting of 11 questions (each question had four possible answers of which only one was correct). In the six-month period following the course, each member of just one of the groups was sent by email a word game to play every month on his or her own. The games were created based on the steps and procedures of cardiopulmonary resuscitation. Both groups were retested by questionnaire six months after the end of the course.

**Results:** After six months, students in the group that played the post-course games showed a median of 10 correct answers (mean 9.74, Q1:9 Q3:11), which was statistically significant ( $p = 0.022$ ) compared to the control group, which had a median of 9 (average 9.24 Q1:8 Q2:10). Furthermore, comparing within each



group the results of those completing the questionnaire at six months with their previous questionnaire results obtained immediately post-course, we found that the results for the group that played the games were not statistically significant variation of results ( $p=0.21$ ), but there was a decline in the knowledge retention in the control group ( $p=0.016$ ).

**Discussion:** The results show that the group members that were stimulated over time by simple word games had better theoretical knowledge of BLS than the control group and that this theoretical knowledge was retained over time.

**Conclusion:** Requiring BLS course participants to play word games based on course contents consolidates and enables retention of previously acquired theoretical principles.

### **BREAST CANCER DETECTION RATES IN PATIENTS WITH B3 BREAST LESIONS: A 13 YEAR RETROSPECTIVE REVIEW.**

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**Background:** B3 lesions comprise a heterogeneous group of breast lesions with an increased risk of subsequent breast malignancy. Although traditionally B3 lesions have been surgically excised, increasing workload and potential of over-treatment of such lesions have meant that breast units in the United Kingdom have looked towards alternative percutaneous diagnostic and treatment methods. Many units now manage these lesions with large volume core needle biopsy and 5 yearly mammographic follow up. This study aims to establish the incidence, nature and timing of malignancy associated with B3 lesions, and to assess whether such mammographic surveillance programmes are appropriately targeted.

**Methods:** Retrospective, single-centre, review of all screen detected B3 lesions (identified on core or diagnostic excision biopsy) between 1995 and 2008.

**Results:** 188 B3 lesions identified. Each patient had a median of 6 follow-up mammograms (range 0-9). 16 cases (9%) subsequently developed breast cancer (13 invasive, 3 high grade DCIS). Median time-to-diagnosis was 5 years (range 1-18yrs). 4 patients were diagnosed after 1 year (3 at the original site, 1 contralateral nodal metastasis). 12/16 cancers were in the ipsilateral breast, but only 7/12 were at the same site as the index lesion. The spectrum of B3 diagnoses that subsequently developed into cancer varied.

**Discussion:** The observed cancer detection rate of 9% is higher than expected for a screened population (cancer detection rate is approximately 5-7 per 1000 for similar age group). However, in this cohort, subsequent cancer occurred either early, representing a failure of initial assessment, or much later, consistent with studies suggesting that the presence of B3 lesions are a risk factor for breast cancer development.

**Conclusion:** We propose a more appropriate and cost effective follow-up strategy of a single mammographic review at one year followed by return to the routine NHS breast screening programme.

### **PROFILE OF THE OCULAR DIMENSIONS, INTEROCULAR ASYMMETRY AND THEIR ASSOCIATIONS IN AN OLDER WHITE POPULATION: THE EDINBURGH EYE STUDY.**

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**Introduction:** Interocular asymmetry of biometric dimensions such as axial length (AL), corneal curvature (Km) and anterior chamber depth (ACD) is associated with many disabling eye conditions and has been shown to reduce vision-related quality of life. However there is limited reported data on the influence of environmental factors towards these biometric dimensions. This was the first large-scale European study to evaluate the associations of ocular dimensions and interocular asymmetry with adult stature and socio-demographic status.

**Methods:** This was a population-based cross-sectional study of adult Caucasians with cataract aged  $\geq 50$  in Scotland. Data were available for 231 males and 279 females with phakic eyes. AL, Km and ACD were measured using partial coherence laser interferometry. Interocular asymmetry was the absolute difference of these dimensions between both eyes. Scottish Index of Multiple Deprivation (SIMD) was used to examine the sociodemographic distribution of the sampling population. A comparative analysis of the mean values for male and female was performed. Multivariate regression models were constructed to examine the effect of height, weight and SIMD on the ocular biometric components and interocular asymmetry.

**Results:** Interocular asymmetry in all AL, Km and ACD were higher in females ( $p < 0.001$ ). Height, weight and SIMD were positively correlated to AL ( $p < 0.001$ ) but not ACD. Height and weight were both negatively correlated to Km ( $p < 0.001$ ). Height was inversely correlated to interocular Km asymmetry ( $p < 0.001$ ). Weight and SIMD demonstrated no significant correlation with interocular asymmetry of the ocular dimensions.

**Conclusion:** Longer AL was found in taller, heavier and more affluent adults. Taller and heavier persons have a flatter cornea profile of less convex dioptric power. ACD was free from the influence of adult stature and sociodemographic status. Findings suggest strong environmental determinants for AL, Km and ACD, but not the interocular asymmetry of these ocular dimensions.

#### **AN INVESTIGATION INTO THE EFFECTS OF INTER-INDIVIDUAL DIFFERENCES IN THE EXPRESSION LEVELS OF NEUROCHEMICAL MARKERS IN THE ORBITOFRONTAL CORTEX AND NUCLEUS ACCUMBENS ON REVERSAL-LEARNING.**

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**Background:** Investigations of reversal-learning performance following selective lesions and/or drug administration have established a prominent role for the orbitofrontal cortex (OFC), which depends on the functional integrity of serotonergic inputs to this region. A critical question is how reversal-learning is influenced by innate differences in neurochemical markers. This study examines how the performance of rats in a spatial reversal-learning task is influenced by inter-individual differences in mRNA expression levels of the  $\alpha 7$  sub-unit of the nicotinic acetylcholine receptor ( $\alpha 7$ nAChR), the 5-HT<sub>2A</sub> receptor and the 5-HT<sub>2C</sub> receptor in the OFC and nucleus accumbens (NAcc).

**Materials/methods:** Rats were trained on a spatial discrimination reversal-learning task. Two nosepoke holes were available and only one was reinforced. Following attainment of criterion, three reversals were presented. Rats were stratified according to reversal-learning performance, measured by an index of perseverative responding. mRNA expression levels of the markers were measured using quantitative reverse transcriptase polymerase chain reaction.

**Results:** We found no association between perseverative responding and expression levels of any of the markers in the lateral OFC. We found that highly perseverative rats showed reduced expression levels of the  $\alpha 7$ nAChR in the right, but not in the left, NAcc compared to minimally perseverative rats.

**Discussion:** These findings contrast with conclusions from previous lesion and drug administration studies, implicating primarily the OFC, rather than the NAcc, in reversal-learning. Thus, pre-existing differences in neurochemistry may contribute differentially to reversal-learning performance with respect to selective brain lesions and pharmacological agents. In particular, our findings suggest a previously unrecognised role for the NAcc in reversal-learning.

**Conclusion:** The results indicate that pre-existing differences in the expression levels of the  $\alpha 7$ nAChR in the right NAcc influence the performance of rats in spatial discrimination reversal-learning. The present findings may be relevant to neuropsychiatric disorders in which there are reversal-learning deficits, including obsessive-compulsive disorder.

## THE DERIVATION AND VALIDATION OF A NEW ALGORITHM FOR THE EARLY DIAGNOSIS OF PANCREATIC CANCER.

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**Background:** Pancreatic cancer is the 5th most common cause of death in the UK. It has one of the worst 5 year survival rates (<4%) out of the all common cancers. The symptoms are often non-specific, most of which arise later in the disease process when curative surgery is no longer viable. 50% of patients are diagnosed following emergency presentation resulting in lower survival rates compared with other routes of diagnosis. The clinical decision tools QCancer® and Risk Assessment Tool (RAT) have been developed and used in primary care to identify patients at risk of pancreatic cancer in order to aid early diagnosis. A symptom questionnaire was devised and piloted to determine 1) the efficacy of existing decision tools in identifying symptoms of pancreatic cancer and 2) the prevalence and timing of associated symptoms.

**Methods:** This was a hospital based case control study which involved the piloting of a novel symptom questionnaire. Symptoms from both current clinical decision tools for pancreatic cancer: the QCancer® tool and the RAT were included. Face to face interviews were conducted with patients with confirmed pancreatic cancer (n=6), cholangiocarcinoma (n=6) and benign pancreatobiliary disease patients (n=13). QCancer® and RAT score were calculated from recalled symptoms.

**Results:** The median QCancer® 2013 score is higher in pancreatic cancer patients (2.47%) compared with cholangiocarcinoma patients (0.74%) and benign pancreatobiliary patients (0.44%). Out of all the symptoms in the questionnaire, unintentional weight loss, abdominal pain, heartburn, back pain, steatorrhoea, diarrhoea, were reported by a majority (>50%) of pancreatic cancer patients.

**Conclusion:** Use of symptoms in a diagnostic algorithm have a role to play in early diagnosis of patients with pancreatic cancer in a primary care setting. This in turn will benefit improve outcomes and survival rates for patients with pancreatic cancer.

## UNDERSTANDING THE PATHOPHYSIOLOGY OF BOWEL DYSFUNCTION IN UROFACIAL SYNDROME.

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**Background:** Urofacial syndrome (UFS) is a rare autosomal recessive condition that causes an unusual facial expression and bladder-voiding dysfunction, which may progress to renal failure if left untreated. UFS may be caused by loss-of-function mutations in HPSE2 or LRIG2 genes, with mutations hypothesised to cause a peripheral neuropathy affecting the bladder and face. Many individuals with UFS also have bowel dysfunction, including constipation. The pathophysiology of this dysfunction is currently unknown, however, we speculate that it also results from HPSE2/LRIG2 mutations. Normal bowel function depends on complex interactions between the enteric nervous system, the muscular layers of the bowel wall, and the interstitial cells of Cajal, which work in synchronisation to bring about normal digestion and defecation. If any of these components is disrupted, as demonstrated by conditions such as Hirschsprung's disease, constipation and, in more severe cases, obstruction, results.

**Methods:** Using animal models provides an opportunity to advance knowledge of this condition. Firstly, using a combination of in-situ hybridisation and immunochemistry techniques, we are determining the expression profiles of HPSE2 and LRIG2 genes and encoded proteins within the normal developing mouse bowel. Secondly, using a combination of histological, immunohistochemical and electrophysiological techniques, we are analysing the structure and function of explanted bowel from an HPSE2-deficient mouse model, generated by insertion of a gene trap vector. Biochemical analyses are also determining if these HPSE2-deficient mice have altered transcription of neural or muscular molecules.

**Conclusion:** Collectively, these experimental approaches are helping to determine the pathophysiology of bowel dysfunction in UFS, which ultimately will assist the development of more specific therapeutic strategies.

**TICAGRELOR VERSUS CLOPIDOGREL: INCIDENCE OF DYSPNOEA AND BLEEDING IN PATIENTS TREATED FOR NEWLY DIAGNOSED ACUTE CORONARY SYNDROME.**

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Ticagrelor is an oral antiplatelet agent that achieves greater platelet inhibition than Clopidogrel. Since publication of existing NICE ACS guidelines in 2010, the PLATO study (n=18,624) found the former drug to have a significantly better efficacy in acute coronary syndrome (ACS) patients. Based on this evidence Ticagrelor achieved NICE regulatory approval in 2011. However subgroup analysis identified a possible increased incidence of dyspnoea and non-procedure related bleeding although overall major bleeding rates were similar. Our goal was to assess the relative incidence of these adverse events to determine whether these agents have similar safety profiles. Prospective, open-label study of ACS patients presenting to Worthing Hospital over a six-month period was performed. A total of 66 patients satisfied our inclusion criteria. The Clopidogrel and Ticagrelor groups did not differ significantly in their incidence of dyspnoea (11.7% and 16.7% respectively;  $P=0.64$ ) or bleeding (5.8% and 4.2% respectively;  $P=0.77$ ). The dyspnoea was transient and did not lead to discontinuation and benign rectal bleeding that resolved spontaneously was the most common presentation of the latter. This study suggests a similar incidence of dyspnoea and bleeding between the two agents. We recognise the limitations of our small cohort and application of our results however they correlate with larger, international trials (PLATO & DISPERSE) with regard to bleeding. These results, in combination with a previously demonstrated greater efficacy, support the use of Ticagrelor with Aspirin as first line anti-platelet therapy for ACS patients in the UK and formal consideration in future NICE ACS clinical guidelines.

**STAPHYLOCOCCUS AUREUS NASOPHARYNGEAL CARRIAGE IN RURAL AND URBAN NORTHERN VIETNAM.**

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**Background:** Staphylococcus aureus is a common human pathogen that can colonise the respiratory tract. Colonisation is associated with increased risk of infection. Here we investigate the risk factors associated with nasopharyngeal carriage of *S. aureus* (including MRSA) in northern Vietnam.

**Methods:** Nasopharyngeal swabs, socioeconomic and demographic data were taken from 1,016 participants aged between 2-90 years in urban and rural northern Vietnam, who were randomly selected from within pre-specified age strata. Data was analysed using Pearson's chi squared test, Fisher's exact test and stepwise backward regression.

**Results:** Overall *S. aureus* prevalence was 33.8% (95% CI: 29.4-38.8). Carriage was found to be associated with younger age [ $\leq 5$  years (OR: 3.13; CI: 1.62-6.03), 6-12 (OR: 6.87; CI: 3.95-11.94), 13-19 (OR: 6.47; CI: 3.56-11.74), 20-29 (OR: 4.73; CI: 2.40-9.31), 30-59 (OR: 1.74; CI: 1.04-2.92), with  $\geq 60$  as reference], living in an urban area (OR: 1.36; CI: 1.01-1.83) and antibiotics use (OR: 0.69; CI: 0.49-0.96). MRSA was detected in 7.8% (CI: 5.9-10.4). Being aged  $\leq 5$  years (OR: 4.84; CI: 1.47-15.97), 6-12 (OR: 10.21; CI: 3.54-29.50), 20-29 (OR: 4.01; CI: 1.09-14.77) and wealth ( $>3/5$  wealth index; OR: 1.63; CI: 1.01-2.62) were significant risk factors for MRSA carriage. Prevalence of nose only carriers, throat only carriers, and nose and throat carriers were 8.7% (CI: 7.0-10.6), 13.9% (CI: 11.8-16.2), and 7.2% (CI: 5.7-9.0) respectively.

**Discussion:** Nasopharyngeal carriage of *S. aureus* (26.4% MRSA) was more prevalent among children. Pharyngeal carriage was more common than nasal carriage. Those  $\leq 5$  years had lower than expected *S. aureus* carriage, potentially due to high antibiotics use (41.2%). Wealth was a risk factor for MRSA carriage, which might be due to increased access of the wealthy to health care settings.

**Conclusion:** Risk factors to *S. aureus* carriage in northern Vietnam were identified and can be used to design infection prevention strategies.

### **PAD INHIBITION: A NOVEL PATHWAY FOR CARDIOPROTECTION.**

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**Background:** Rapid reperfusion of cardiac tissue is the most effective method for minimising infarct size following acute myocardial infarction (AMI). Reperfusion, however, can paradoxically result in the death of cardiomyocytes. Peptidylarginine deiminases (PADs) are a group of enzymes that convert arginine residues to citrulline in posttranslational modification. PADs become active in high calcium states and have recently been shown to exert harmful effects during in vivo reperfusion in a mouse. Here, a novel PAD inhibitor is tested for cardioprotective effects in simulated ischaemia reperfusion of primary rat ventricular cardiomyocytes.

**Methods:** Hearts from male Sprague-Dawley rats were retrogradely perfused on a Langendorff apparatus. Collagenase digested the tissue to give viable ventricular cardiomyocytes that were plated on laminated dishes. These cells were subjected to three hours of either hypoxia or normoxia. They were then all reoxygenated for an hour with 1ul of a control vehicle, 2ul of insulin, or 1ul of two different concentrations of the PAD inhibitor (100uM and 1uM). The cells were then stained and imaged. A percentage of cell death was obtained for each group.

**Results:** A significant reduction in cell death was observed in the cardiomyocytes reoxygenated in the presence of the higher dose of the PAD inhibitor (34.0%) compared to the control (56.8%) ( $p=0.01$ ).

**Conclusion:** This novel PAD inhibitor has demonstrated cardioprotection in a simulated ischaemia reperfusion model of cardiomyocytes. Further work is needed to assess this drug's potential for use in the prevention of reperfusion injury in an acute clinical setting.

### **INVESTIGATING MECHANISMS OF RADIORESISTANCE IN NON-SMALL CELL LUNG CANCER: IMPLICATIONS OF REPAIR, DAMAGE TOLERANCE AND LESION COMPLEXITY IN A MULTIFACTORIAL PROCESS.**

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Radiotherapy (RT) is the common treatment modality in non-small cell lung cancer (NSCLC) however, efficacy is limited, with local control rates of only 30-50% and 20% for stage I and III respectively. Poor outcomes of RT are largely attributed to radioresistance of tumours to ionising radiation (IR). Currently attention has been paid to measures of DNA damage formation and repair as prospective mechanisms and predictors for cancer cell radiosensitivity; theorising that higher induced DNA damage levels and deficiencies in DNA repair mechanisms confer increased radiosensitivity.

In this study we attempted to determine potential mechanisms of radioresistance in NSCLC, whilst attempting to validate the use of the alkaline comet assay (ACA) as a viable single end point test to predict lung cancer cell radiosensitivity. To achieve this, IR-induced DNA damage formation and repair responses in a NSCLC model were analysed using both ACA and  $\gamma$ -H2AX assays, and compared with the cell survival responses from clonogenic assay.

Radioresistance was found to differ within the NSCLC model, with significant differences seen in DNA damage, repair and cell survival ( $P<0.05$ ) (one-way ANOVA). The observations in this study highlight radioresistance in NSCLC as a multifactorial process, implicating both DNA damage repair and tolerance as resistance mechanisms. Interestingly, DNA damage levels did not totally reflect IR sensitivity, suggesting the potential role of lesion complexity in survival and repair responses. The findings also highlight the pitfalls of using a single end-point as a predictive measure of radiosensitivity, suggesting multiple-end point analyses would provide a more accurate predictor.

**OBSTRUCTIVE SLEEP APNOEA SYNDROME (OSAS) AND TYPE 2 DIABETES (T2D)**

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OSAS is a sleep disorder in which there are recurrent episodes of upper airway collapse (apnoeas). Transient hypoxia and increased sympathetic drive lead to repetitive arousals and excessive daytime sleepiness (EDS). The three main symptoms of OSAS are EDS, snoring, and witnessed apnoeas. The prevalence of OSAS in the general population is approximately 3%. There is an independent association between T2D and OSAS which may be bidirectional. In this study we assessed the prevalence of OSAS in T2D patients in Wales using a questionnaire. 50 patients attending diabetes clinics participated in this study. The questionnaire incorporated elements from the Berlin Sleep Questionnaire, Wisconsin Sleep Questionnaire, and the Epworth Sleep Scale. Body Mass Index (BMI), HbA1c, and blood pressure data were collected. Participants were scored for symptoms of OSAS. 10 patients had symptoms indicating OSAS. Of these 4 patients were already diagnosed with OSAS, 1 had three symptoms of OSAS and 5 had two symptoms of OSAS which would indicate referral for specialist assessment. The prevalence of patients with significant OSAS symptoms or previously diagnosed OSAS is 22.2%. A higher BMI indicated a higher risk of OSAS ( $p = 0.04$ ). There was no statistical difference in HbA1c or hypertension between the groups. These findings are comparable to studies conducted in similar fields. This study is limited by sample size, and would be improved by confirming results with polysomnography. The prevalence of OSAS based on this questionnaire study is increased in T2D in Wales compared to the general population. This finding is important as OSAS is a potentially modifiable factor associated with T2D, obesity, and vascular disease. These results suggest that healthcare professionals involved in the management of patients with T2D should be aware of symptoms suggesting OSAS and that a questionnaire is a useful screening tool.

**ADIPOSE-DERIVED STEM CELLS: A SUB-POPULATION OF INTEREST FOR FAT GRAFT SUPPLEMENTATION.**

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**Background:** Autologous fat grafting is widely used in soft tissue reconstruction, however it has unpredictable survival rates. A new experimental technique aims to improve graft survival by supplementing it with Stromal Vascular Fraction (SVF) generated from enzymatically digested fat. SVF contains high levels of adipose-derived stem cells (ASCs), as well as other cell types. ASCs can be characterised by CD surface markers, with CD24+ and CD34+ sub-populations postulated to harbour adipocyte progenitor cells.

**Methods:** CD34 and CD24 expression was studied in SVF from fresh adipose tissue samples and in cultured ASCs by flow cytometry. Sub-populations sorted for these markers (via magnetic activated cell sorting, MACs) were further assessed for proliferation (MTS assays) and adipogenic differentiation (PCR for PPAR $\gamma$ , FABP4 and ELISA for leptin).

**Results:** All ASC populations demonstrated multi-lineage differentiation and surface markers in keeping with mesenchymal stem cells (MSCs). Immunohistochemistry further revealed a putative CD34+/CD90+/CD31-/CD45- non haematopoietic, non-endothelial population in fresh adipose tissue. In the SVF, we report 49 % CD34+ and 18% CD24+ cells. Sorted CD34+ cells from the SVF were significantly more proliferative and plastic adherent in comparison to unsorted ASCs and CD34- populations ( $p < 0.001$ ). Gene expression analysis (PCR) demonstrated greater adipogenic potential of CD34+ populations over unsorted ( $p > 0.05$ ) and CD24+ ( $p < 0.05$ ) cells. CD24+ cells showed poor attachment and proliferation in vitro but adequate adipogenesis. With time in culture CD34 expression decreased, with no CD24+ cells seen.

**Discussion:** A CD34+ MSC subpopulation is present in abundance in SVF from fresh fat and in early P0 cells. This subpopulation has a higher proliferation, plastic adherence and adipogenic potential than unsorted SVFs cells.

**Conclusion:** CD34+ ASC sub-population selection may offer benefit over unsorted SVF cells to supplement fat grafts, improving survival and ultimately clinical patient outcomes.

### NS8593 AS A NOVEL ANTI-ARRHYTHMIC AGENT FOR TREATMENT OF ATRIAL FIBRILLATION.

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**Background:** Voltage-gated ion channels classically mediate the cardiac action potentials. Recently, the role of small conductance calcium activated potassium channels (SK) has emerged. Selective modulation of these channels provides a novel target to prevent atrial fibrillation (AF) without exerting pro-arrhythmic effects on the ventricles. R-N- (Benzimidazol-2-yl)-1, 2, 3, 4-tetrahydro-1-naphthylamine (NS8593) has been previously shown to terminate atrial fibrillation by inhibition of SK channels in mammalian cardiac myocytes.

**Aims:** To establish the extent to which NS8593 is selective for the SK channels.

**Methods:** Various current carrying subunits that contribute to cardiac action potentials were expressed in HEK 293 cell lines. Whole cell patch clamp electrophysiology was used to record currents from these channels before and after application of the drug.

**Results:** NS8593 resulted in a  $65.5 \pm 43.8\%$  inhibition ( $n=5$ ) of SK2 currents, reduction of Kv2.1 peak current amplitudes by  $18.9 \pm 4.2\%$  ( $n=4$ ). Kv1.5 current at holding potential of 0mV and 100ms pulse had a reduction of  $55 \pm 1.5\%$  ( $n=6$ ) ( $p=0.03$ ). Cav1.3 (a2b1 and b2a1) subunits elicited currents by a 300ms test pulse showed reduction of  $19.9 \pm 7\%$   $n=3$  and  $18 \pm 4.46\%$  for pooled data ( $n=8$ ). Cav1.3 (a2b1 and b2a1 subunits) currents elicited by a 300ms test pulse at voltage clamp of 0 mV showed a reduction in of  $19.9 \pm 7\%$   $n=3$  and  $18 \pm 4.46\%$  for pooled data ( $n=8$ ). HERG channel currents were blocked by  $76.6 \pm 22.8\%$   $n=8$  ( $p=0.0153$ ) on single tail current protocol.

**Conclusions:** NS8593 is not SK selective and blocks a range of ion channels underlying the cardiac AP. Therefore, it is not a novel anti-arrhythmic drug. However, it has a potential therapeutic profile comparable to class III anti-arrhythmic drugs.

### EVALUATION OF CD69+ HUMAN T-CELL PHENOTYPES AFTER CO-CULTURE WITH GENETICALLY-MODIFIED PIG MESENCHYMAL STROMAL CELLS.

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**Background:** The increasing worldwide shortage of human organs for transplantation has focussed research on the possibility of transplanting animal organs, especially from pigs, into humans. Xenotransplantation – i.e., the transplantation of organs, tissues, and cells across species, using genetically-engineered pigs as the source, offers the potential to resolve this shortage. A key genetic- modification in donor pigs is the deletion of the  $\alpha$ -1,3-galactosyltransferase gene (GTKO). Additionally, pigs which are transgenic for human complement regulatory proteins such as CD46 and CD55 are now available. Mesenchymal stromal cells (MSC), with self-renewal, multi-differentiation, anti-inflammatory, and immunomodulatory properties, have been widely studied in preclinical and clinical trials. We have shown previously that MSC isolated from GTKO pigs additionally transgenic for human CD46 and CD55 (GTKO/CD46/CD55 pMSC) downregulate human T-cell responses to pig antigens in vitro, which is associated with upregulation of CD69 expression on human T-cells. We evaluated the phenotype of CD69+ T-cells after co-culture with GTKO/CD46/CD55 pMSC.

**Methods:** GTKO/CD46/CD55 pMSC were co-cultured with human PBMC for 48 hours prior to stimulation with phytohemagglutinin (PHA). PBMC proliferation was assessed by thymidine incorporation. After co-culture, CD69+CD4+ and CD69+CD8+ T-cell phenotypes were evaluated by flow cytometry.

**Results:** Following co-culture with GTKO/CD46/CD55 pMSC, human PBMC, showed a significant reduction in proliferation in comparison to PBMC cultured alone ( $p<0.05$ ). GTKO/CD46/CD55 pMSC did not induce human T cell apoptosis or upregulate CD25 or Foxp3 expression, indicating that T-regulatory cells were not recruited. Indeed, after co-culture, there were increased percentages of CD69+CD25-CD4+ and CD69+CD25-CD8+ T-cells, in comparison to PBMCs cultured alone.



**Conclusions:** Immune regulation of human T-cells by GTKO/CD46/CD55 pMSC is not associated with either apoptosis or an increase in regulatory T-cells. Suppression of human T-cell proliferation by pMSC is probably due to a distinct, and hitherto unknown, mechanism related to upregulation of CD69.

## MECHANISM AND STRATEGY OF THE TREATMENT OF WOUND HEALING IN DIABETES.

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Diabetic foot ulceration (DFU) remains a serious health concern for diabetic patients and has a major impact on healthcare costs. For diabetic subjects, DFU is a major clinical problem that significantly decreases the quality of life and results in prolonged hospitalization. Impairment in the skin microcirculation of the diabetic foot prevents full vasodilation under conditions of stress, resulting in reduced skin oxygenation. Thus, neuropathy, ischemia and vascular disease factors play a role in the development of DFU, while inflammation, impaired growth factor and bone morphogenetic proteins (BMP) levels are associated with a failure to heal DFU. Neuropeptides that are secreted in the skin from small nerve fibers, such as neurotensin (NT) and others, also play a direct role in regulating local inflammatory responses and angiogenesis. Our primary hypothesis is that the existing pro-inflammatory state in diabetes is coupled to the decrease in levels of BMP7 and the magnitude of this interaction greatly affects wound healing. We propose to examine this hypothesis by studying skin wound healing in a mice model with and without diabetes. Angiogenesis and inflammation in BMP7 heterozygous diabetic and non-diabetic mice and their control littermates were evaluated by histology and immunohistochemistry. The same parameters in this model were evaluated after treatment with NT. Preliminary results have shown a significant improvement in the healing of the female BMP7 heterozygous diabetic mouse wounds after treatment with NT, supporting its role in the inflammatory and regenerative response. Further studies are needed to better understand the role of BMP7 and NT in skin wound healing.

## TLR-4 EXPRESSION IS ASSOCIATED WITH ACTIVE ALLERGIC EYE DISEASE AND MAST CELL ACTIVATION.

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**Introduction:** Allergic Eye Disease (AED) is a common condition, affecting approximately 20% of the population. Typically, patients present with varying levels of conjunctival inflammation that can cause, corneal changes, scarring and visual loss. Aeroallergen exposure and their interactions with the conjunctival epithelium are thought to be an important pathogenic factor. Effects from the innate immune system in damaging the conjunctival epithelium, in patients with AED, have been recognised to be relevant in patients with active AED. It is thought that Toll-Like Receptors (TLRs) play an active role in the pathogenesis, however the actual mechanism is unknown. The aim was to examine TLR-4 expression in the conjunctival epithelium of human subjects with AED. Furthermore, to establish whether there are differences between active/inactive AED and seasonal/non-seasonal AED subjects.

**Methods:** Seven Seasonal allergic conjunctivitis (SAC), 7 Out of season (OOS) allergic conjunctivitis, 6 Perennial allergic conjunctivitis (PAC) and 5 normal control specimens were examined. Immunohistochemically for TLR-4 expression (anti-human TLR-4 antibody) and quantified in a masked fashion for the percentage epithelia stained for the marker using Image analysis software.

**Results:** Mean percentage staining of TLR-4 expression was significantly greater in SAC, PAC and Normal patients in comparison to OOS, respectively ( $P = <0.01$ ,  $P = 0.01$ ,  $P = 0.01$ ).

**Conclusion:** Conjunctival epithelial TLR-4 was significantly up regulated in SAC and PAC. However, TLR-4 expression was significantly lower in OOS, in comparison. This supports the view that TLR-4 plays an important role in the pathogenesis of AED. While suggesting there is a difference between seasonal and non-seasonal AED.

## A STUDY TO ASSESS CONFIDENCE LEVELS IN BASIC SURGICAL SKILLS AMONG INTERNATIONALLY TRAINED JUNIOR DOCTORS.

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**Background:** Basic Surgical Skills such as safe surgical practices, appropriate handling of surgical instruments and suturing are expected to be performed by every junior doctor all over the globe, irrespective of their future specialization. These skills might also influence them in laying a path to a surgical career. This study assesses the intrepidity of basic surgical skills among a sample of internationally trained junior doctors who are pursuing Master degree in a variety of disciplines in a university, in the UK.

**Methods:** An anonymous 5 point questionnaire was sent through SurveyMonkey to be filled in by 22 International medical graduates (IMG's) studying at a University in the UK, of which 20 members completed the survey. The results were collated in Excel Spreadsheet, interpreted as ordinal data and relayed to the sample group.

**Results:** The data on confidence levels were dichotomized into grouped responses -as Confident and not confident. Out of 20 IMG's, 60% stated that they have moderate knowledge on basic surgical operating standards. 63% answered that they are not confident in administering local anesthesia prior to a basic surgical procedure. Half of the IMG's mentioned that they are not confident in the usage of various suturing techniques. 85% of the sample group agreed that they have intensions to train and practice in the UK.

**Conclusions:** This study evidenced that a significant proportion of IMG's are not confident in performing basic surgical procedures and interprets that they have moderate knowledge on surgical operating standards. An organized, Basic Surgical Skills teaching program for IMG's who have intensions to practice in the UK, may increase the confidence levels and also helps them in adapting to the standards of healthcare system in the UK.

## THE PROGNOSTIC SIGNIFICANCE OF ANAEMIA IN THE ELDERLY.

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**Background:** Anaemia in the elderly is increasingly becoming a cause for concern as the world population of individuals aged 65 and over increases. Anaemic disorders are associated with poor prognosis in the elderly; therefore better understanding of outcomes such as mortality and hospitalisation rates could lead to the development of better treatment and management options for elderly individuals with anaemia, ensuring a better quality of life.

**Methods:** Electronic searches identified general population based studies that compared mortality and hospitalisation rates in the anaemic elderly with that of the non-anaemic elderly. A meta-analysis used forest plots to explore significant differences in the mortality and hospitalisation rates between the anaemic and non-anaemic elderly populations with the use of risk and hazard ratios.

**Results:** A meta-analysis of 14 studies with a total of 50,464 subjects and a follow up period ranging from 1.4 to 23 years were included in this study. Of these, 15.9% had anaemia according to the WHO criteria. Forest plots indicated a risk ratio of 2.29 (95% CI, 2.03 – 2.58) for mortality, and a risk ratio of 1.75 (95% CI, 1.53 – 2.02) for hospitalisation in the elderly anaemic population.

**Discussion:** Anaemia appears to have a poor prognostic significance in the elderly with mortality and hospitalisation rates affected in these individuals. The results of this meta-analysis aid in determining the significance of this effect by addressing the extent of the difference in the mortality and hospitalisation rates of the anaemic elderly compared to the non-anaemic elderly.

**Conclusion:** Anaemia is of prognostic significance in the elderly with increased mortality and hospitalisation rates observed in this population compared to the non-anaemic population. Early diagnosis and better treatment options for some anaemic disorders in the elderly need to be developed to tackle this issue of poor prognosis.

**THE LANDMARK TECHNIQUE FOR FASCIA ILIACA COMPARTMENT BLOCKS - A CADAVERIC STUDY.**

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**Background:** The fascia iliaca compartment block is commonly used to provide pain relief for femoral fractures. Classically the landmark technique was used, however in the advent of affordable, portable ultrasound machines, ultrasound guided techniques have become more common place. Nonetheless instances still occur where the landmark technique is still employed such as in the emergency department. In this study we used a cadaveric model to assess the potential efficacy of the landmark technique for the anterior approach.

**Materials/methods:** A single cadaver from the laboratory of Human Anatomy of the University of Glasgow was used following ethical approval. A consultant anaesthetist was invited to simulate a fascia iliaca compartment block using the anterior approach on the left thigh of the cadaver using 20mls of Indian ink mixed with 10% latex. The ink was given 10 days to set before subsequent dissections were performed to investigate the spread of the ink.

**Results:** Results showed no rostral movement of the ink into the abdomen. Dissection of the left thigh showed the ink travelling in columns caudally, covering the femoral and lateral cutaneous nerve of thigh. The obturator nerve was unaffected by the ink.

**Discussion:** Results of this study showed the ink to travel in the opposite direction to that expected. Two of the three major nerves of the plexus were reached nonetheless. This corroborates with the literature. Limitations of this study include the difference in the tissues between live patients and cadavers and limited flexibility to allow positioning of the cadaver compared to live patients.

**Conclusion:** This study provides evidence that the landmark technique for the anterior approach to the fascia iliaca compartment blocks remains an alternative should ultrasound be unavailable; however it remains difficult to reach all three branches of the plexus nerves of the lower limb with a single injection.

**ANALYSIS OF RECREATIONAL DRUGS OBTAINED FROM PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT, LONDON.**

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Acute recreational drug toxicity is a common presentation to emergency departments. Recreational drug users face fatal health risks particularly as these drugs are not controlled or supervised by medical professionals. Currently in the UK, routine toxicology screening is not available. This is mainly due to laboratory toxicology results being unavailable in a time frame that would have an immediate impact on the management of the patient. Data on trends of recreational drug use in local areas are often unavailable. This study analysed recreational drugs obtained from patients presenting to St Thomas's emergency department, London with acute recreational drug toxicity. Drug samples were delivered to TICTAC, a drug database company situated at St George's University of London. The contents of each bag were documented and categorised on the basis of their physical appearance. All liquids were analysed via Fourier Transform Infrared Spectroscopy. Tablets and powders were subjected to analysis using Gas Chromatography Mass Spectrometry. A total of 65 samples were analysed. Of these 36 (55%) were liquids, 24 (37%) powders, 3 (5%) and 2 (3%) contained cannabis. Liquid samples were shown to contain either Gamma Butyrolactone (GBL) or poppers. The majority of powders contained Mephedrone (42% of all powders), followed by MDMA (17%), Amphetamine (8%), Methamphetamine (4%), Ketamine (4%). 13% of powders contained the designer drug methoxetamine in addition to 1 bag of Paramethoxymethamphetamine in combination with the novel substances, alpha pvp, 4-mec, 4 fluoromethamphetamine. This study has provided a 'snapshot' on the pattern of recreational drug use in the area surrounding the local emergency department. This will be helpful for doctors by providing knowledge of drug epidemiology in the local area. The results suggest that ongoing analyses are helpful in monitoring the latest trends in drugs and detecting emerging new drugs.

## TRAUMATIC BRAIN INJURY - DOES HIGH BLOOD ALCOHOL LEVELS ON ADMISSION AFFECT PLATELET COUNT?

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**Aim:** This study aims to determine the correlation between blood alcohol concentration (BAL) on admission and platelet count of TBI patients.

**Background:** In the UK, alcohol can be detected in up to 60% of TBI patients on admission. Studies have shown that platelet production and function is affected by alcohol consumption. Alcohol can inhibit and slow down the production of platelets by the bone marrow and has been shown to decrease platelet aggregation and activity in vitro

**Methods:** Patients were identified from St Mary's Hospital's neurotrauma database. 175 patients with traumatic brain injury (EDH, SDH, SAH, IVH) who presented to the major trauma centre from 01/01/12 to 01/07/12. The threshold for high BAL is > 80mg/100ml Thrombocytopenia is defined as platelet count <140

**Results:** 72 out of 175 patients had BAL testing, and out of 72 patients, 39 (54.2%) of them had high BAL. 39 out of 175 (22.3%) had abnormal platelet count on admission or during the first 24 hours. 6/39 (15.4%) of patients had both an elevated BAL and abnormal platelet count 10/33 patients (30.3%) with normal BAL had abnormal platelet count.

**Conclusion:** Our study did not find a statistically significant correlation between high BAL and platelet count. This could relate to the lack of numbers However, patients with normal platelet count can also develop large haematoma. Therefore, platelet count does not equate to platelet function In order to better understand platelet function, we are collecting thromboelastography (TEG) data in TBI patients with elevated BAL on admission.

## ALPHA HAEMOLYSIN AS A MARKER OF INFECTION.

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Hospital acquired infections cause a high rate of death and morbidity, particularly affecting ICU patients who are severely ill often with a degree of immunosuppression. Staphylococcus aureus SA, an opportunistic pathogen which commonly colonises the general population, is a major cause of infection in ICU patients. In our previous studies we have shown that the SA toxin, Alpha Haemolysin, is detectable in 72% of ICU urine samples by Western Blotting (WB). Subsequently, this study has used Enzyme-linked Immunosorbant Assay (ELISA) and WB techniques to screen urine samples from a population of Acute Ischaemic Heart Disease episode patients. Two samples were collected from each patient at the time the episode (AIHD A) and on recovery six weeks later (AIHD B). These samples showed a significantly lower prevalence of AH than was observed in ICU patients, at 29% and 19% respectively. This part of our study shows that the prevalence of AH in ICU patients is very much higher than a control group, but also that in an AIHD population the prevalence is higher following the episode than at follow-up. Differences were observed between AH levels detected by our Enzyme-linked Immunosorbant Assay (ELISA) and WB, with levels apparently higher in WB; our hypothesis is that AH is excreted associated with IgG and therefore undetectable by ELISA. To investigate this we developed an ELISA to screen for AH specific IgG and found that 95% of AIHD A samples contained a detectable amount of IgG. Further work is planned to screen and quantify the ICU and AIHD B samples IgG. This work suggests that toxin levels in urine being a clinically relevant diagnostic technique and raises questions around how toxins are metabolised by the body.

**THE PRONATOR QUADRATUS PEDICLED MUSCLE FLAP; FEASIBLE OR FANTASY?**

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**Background:** Pedicled muscle flaps are of great use in reconstructive and plastic surgery, however, the anterior forearm is an area where there are few viable options for this. The present study discusses the anatomy and use of pronator quadratus (PQ) as a pedicled muscular flap.

**Methods:** Fine dissection of the anterior forearm was carried out on a cadaveric specimen obtained from the Department of Anatomy at King's College London. Flexor pollicis longus and flexor digitorum profundus were identified and the anterior interosseous nerve (AIN) and artery (AIA) were seen to be running between them. PQ was then elevated on its pedicle as described by Dellon and Mackinnon (1984, Journal of Hand Surgery).

**Results:** The AIA and AIN were found to pass deep to PQ before penetrating its posterior aspect. Once elevated on its pedicle, the flap could be moved in a circle with a radius of 5cm, about the point of bifurcation of the ulna artery (giving off the AIA). In this way, the PQ flap could be used over a large area of the anterior forearm from 3cm distal to the elbow to the proximal flexor wrist crease.

**Discussion:** With the extent of mobility offered by the pedicle, there are multiple potential applications including ulnar/median nerve grafting and the treatment of burns or soft tissue injuries. Importantly, muscular function of the forearm is not compromised due to the action of pronator teres.

**Conclusion:** In this case, the PQ flap was found to have anatomy consistent with the existing literature. We found that there was scope to manoeuvre the flap to cover an area of the anterior forearm so the PQ could be theoretically used for soft tissue or burns injuries. However, the technical difficulty of this procedure may limit its use.

*Category: Clinical and Patient Related Work*

**CAROTID REVASCULARISATION: CAN OUTCOMES BE IMPROVED WITH NOVEL TECHNOLOGIES?**

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**Background:** The debate of superiority between the two current standard practices in carotid revascularisation – carotid artery stenting (CAS) and carotid endarterectomy (CEA) is ongoing. The most recent RCT showed increased number of stroke with CAS (4.4% CAS vs 2.3% CEA;  $p=0.005$ ) but less myocardial infarction (1.1% CAS vs 2.3% CEA;  $p=0.03$ ) and cranial nerve injury (0.3% CAS vs 4.8% CEA;  $p=0.0001$ ). A novel technology, the Silk Road Medical MICH system, is promising to offer an entirely new path for carotid revascularisation and integrate the benefits of both CEA and CAS.

**Description of Innovation:** The MICH system consists of arterial (placed via transverse incision at the common carotid artery) and venous return sheaths (placed percutaneously in the femoral vein), connected via a flow controller to create a low resistance arteriovenous shunt circuit. Controlled high-flow-rate flow reversal is then achieved without the need to occlude the ipsilateral external carotid artery. By reversing the flow in the internal and external carotid arteries, the embolic debris are diverted away from the brain before any manipulation of the carotid lesion. Following the clamping of the common carotid artery, a guide wire is introduced through the arterial sheath to pass across the lesion to allow stent deployment.

**Discussion:** The first-in-man single-arm prospective study evaluating the effectiveness of MICH system showed no major adverse events, including major stroke, myocardial infarction and death, in 75 patients through 30 days follow up. There was a 17% rate of new diffusion weighted MRI hyper intensity brain lesions attributed to the procedural microembolisation. This is the lowest rate reported amongst available carotid stenting strategies (50% in transfemoral distal filter protected carotid stenting) and is comparable for the first time to previously published rates in CEA.

**Conclusion:** Two trials will be further evaluating this technology (LOTUS in the UK and ROADSTER in the US) to define its role and efficacy.

**SELECTIVE IMMUNOGLOBULIN-A DEFICIENCY: A LIFE THREATENING TRANSFUSION REACTION (A CASE SCENARIO IN INDIA).**

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**Introduction:** Selective IgA deficiency is a relatively mild genetic condition with deficiency of IgA in the blood. Patients with IgA deficiency have a tendency to develop recurrent sino-pulmonary infections, gastrointestinal infections and disorders, otitis media, skin infection and allergies etc. In this case, an Indian woman, a known case of colon cancer with anaemia, develops severe life threatening transfusion reaction which is later found out to be as a result of SIAD. In India due to inadequate healthcare facilities many patients succumb without even being diagnosed. Very few cases of SIAD have been reported in India till date.

**Case description:** A 55-year-old female, a known case of colon cancer with anaemia, presented to the hospital with history of severe transfusion reaction as soon as blood transfusion was started at a peripheral hospital. Investigations for mismatch status were not known. It was decided to transfuse the patient after careful cross-match for minor blood groups also. Patient was admitted in ICU for monitoring during transfusion. As soon as packed red cell transfusion was started, the patient developed dyspnoea, hypotension and tachycardia. Transfusion was stopped and the patient was revived with hydrocortisone and subcutaneous adrenaline. The blood bag was sent for transfusion reaction investigations which came out to be negative. Selective IgA deficiency was thought of and IgA levels were found out to be low during investigations. Finally, saline washed RBCs transfusion was given without any problems. the course of treatment for colon cancer with anaemia.

**Conclusion:** The patient was diagnosed with selective IgA deficiency in the course of treatment for colon cancer with anaemia.

**Discussion:** Although uncommon condition in the Asian countries like India, selective IgA deficiency should be investigated for in patients with recurrent mucosal infections and unexplained life threatening transfusion reactions. Early diagnosis is important for the likewise vaccinations and prophylaxis against immunological reactions.

## MATERNAL MORTALITY FROM ECLAMPSIA IN MALAWI: A CASE REPORT.

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This is the case report of woman who died from eclampsia in Zomba, Malawi. Having witnessed the tragic death of this patient on my medical elective, I decided to review her case retrospectively in an attempt to discover what factors led to this devastating outcome. AB was a 22-year-old primigravida woman who was referred to Zomba Central Hospital from a neighbouring district having presented with convulsions. Two hours later, she was seen by a doctor who performed a caesarean section through which the 37 week-old baby was saved. Following the procedure, the patient remained unconscious and was transferred to the Intensive Care Unit. My first personal encounter with this patient was being called to see her with the on-call clinician as she was convulsing and struggling to breathe. As the intubation trolley was being set-up, the patient suffered a cardiac arrest and died. Unfortunately, this is not an unusual case in Malawi, with Eclampsia remaining one of the leading causes of maternal mortality. Having reviewed her case, I discovered many pitfalls in this patient's antenatal and emergency care which ultimately led to her completely preventable death. Having presented the case at a departmental meeting in Zomba Central Hospital, I hoped to highlight important issues that potentially could prevent similar tragedies from occurring. Furthermore, by sharing my experience with fellow students and doctors in the UK, I aim to highlight the importance of good antenatal care both in our country and overseas. One woman dies every 90 seconds in pregnancy or childbirth worldwide, a statistics that desperately needs to change. However, the sad reality is that 'women are not dying of diseases we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving' (Mahmoud Fathalla).

## ATRIAL FIBRILLATION IN PATIENT WITH BARTTER SYNDROME.

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Bartter Syndrome (BS) is a hereditary disorder characterized by the association of hypokaliemia, alkalosis, secondary hyperaldosteronism, normal blood pressure and polyuria. In BS patients, standard electrocardiography frequently shows a QT interval prolongation, ST segment depression, and, sometimes, an atrioventricular block related to AV dissociation. In addition, hypokalemia may predispose to life-threatening arrhythmias such as torsade de pointes, ventricular tachycardia, and ventricular fibrillation. We report a case of a 38-year-old man with Bartter Syndrome that showed recurrent episodes of paroxysmal atrial fibrillation (AF) associated with paresthesia of the lower extremities and polyuria. Blood tests showed hypokalemia, hypocalcemia, hypophosphoremia, hyperreninemia, hyperaldosteronism, hypercalciuria and low levels of vitamin D. The patient was converted to sinus rhythm with infusion of Propafenone. Subsequently, an oral therapy with Spironolactone, Vitamin D, Calcium and Potassium supplementation has been prescribed. Since then the patient had not recurrence of AF. This case represents the first evidence of AF in patients with BS. We hypothesize that changes in plasma electrolyte concentrations (especially K<sup>+</sup>, and Ca<sup>2+</sup>) induce changes in the myocardial cells' action potential. The electrolyte imbalance can lead to an instability in the maintenance of the action potential of the plasma membrane and thus abnormalities of generation and conduction of electrical impulses in the myocardium and to prepare to the onset of AF. However, further studies are needed to analyze the cardiac electrophysiology of these subjects in order to better characterize the abnormalities of generation and conduction of cardiac electrical impulses and prevent the occurrence of life-threatening arrhythmias.



## A TROUBLESOME PLEURAL EFFUSION.

Winayak A\*  
Maidstone General Hospital

**Background:** The diagnosis of mesothelioma is a life-changing event for patients, both in terms of the financial compensation that it encompasses and additionally for their quality of life. Secondary pleural effusions can compromise breathing, result in regular hospital visits for their drainage, and be a site of infection with each aspiration. Early diagnosis allows the decision to be taken for pleurodesis, or alternatively for a long-term tunnel drain to be inserted permitting self-aspiration at home.

**Case:** The case described is an 85-year-old man presenting with a massive right-sided pleural effusion. He was therapeutically drained, the fluid was analysed yielding an exudate however no underlying pathology was identified on cytology. Subsequently he attended his respiratory follow-up appointment with the same presentation. Further imaging showed a hydropneumothorax secondary to an effusion superimposed over a trapped lung. Eventually a diagnosis of mesothelioma was made by pleural biopsy.

**Conclusion:** The literature highlights that patients presenting with a unilateral exudative pleural effusion, the differential should always include malignant disease. If initial CT scan and cytology are non-diagnostic, a low threshold for pleural biopsy or Video-Assisted Thoracoscopy should be considered in cases with clinical features highly suggestive of mesothelioma. Ultimately recommendation is for all patients with diagnosed mesothelioma or undiagnosed unilateral pleural effusion where mesothelioma is a possible diagnosis to be promptly referred for discussion at a Lung Cancer Multi-Disciplinary Meeting.

## A RED HERRING - LÖFGREN'S SYNDROME MISDIAGNOSED AS CELLULITIS.

Li W\*  
Pembury hospital, Pembury

**Background:** Löfgren syndrome is a rare acute variant of sarcoidosis that can be easily missed/misdiagnosed. It is characterised by triad of erythema nodosum, bilateral hilar lymphadenopathy and acute onset polyarthrititis. The disease is usually self-limiting and carries a good prognosis. NSAIDs are the mainstay of treatment.

**Discussion:** A 45-year-old man with no significant past medical history presented to A&E with four days of feeling generally unwell, pain in multiple joints and localised tender erythematous lesion around his right ankle. There were no significant findings on examination. He was systemically well with a mildly elevated inflammatory markers. An initial diagnosis of non-specific viral illness and mild ankle cellulitis was made, and he was discharged with a 7-day course of flucloxacillin. Four days later, he re-presented to A&E with worsening polyarthralgia and increasing number of erythematous lesions on both shins, recognised as erythema nodosum. Chest X-ray showed bilateral hilar lymphadenopathy. His white cell count and CRP were further elevated compared to previous admission and ESR and serum ACE level were also elevated. Diagnosis of Löfgren syndrome was made and patient made complete recovery with a course of oral NSAID.

**Case summary:** Erythema nodosum is an inflammatory process involving inflammation of fat cells under the skin resulting in tender red nodules that are usually seen on both shins and can be easily misdiagnosed as cellulitis. However, although Löfgren syndrome is rare, this diagnosis should be considered when examining a patient with erythema nodosum and polyarthralgia.

**A CASE OF LMNA GENE MUTATION CAUSING DILATED CARDIOMYOPATHY IN AN INDIVIDUAL WITH VENTRICULAR ARRHYTHMIAS AND CONDUCTION DEFECTS.**

Sadiq S\*

Peninsula Medical School

Mutations in the LMNA gene are rare and gives rise to highly penetrant clinical phenotypes. LMNA mutations cause malignant cardiac arrhythmias, progressively worsening heart failure and dilated cardiomyopathy. The arrhythmias may lead to sudden cardiac death. This case study reports a 48-year-old asymptomatic male with a family history of sudden cardiac death who presented with a two year history of ventricular ectopics. ECG revealed type I atrioventricular (AV) nodal heart block and multiple ventricular ectopics. Trans-oesophageal echo cardiogram revealed a normal left ventricular systolic function and a mild dilated cardiomyopathy. Genetic studies confirmed that he had a mutation in the LMNA gene. He was subsequently diagnosed with dilated cardiomyopathy due to LMNA gene mutations. Following this, he had an implantable cardioverter defibrillator (ICD) fitted. Patients with LMNA mutations are at high risk of developing life-threatening arrhythmias even when ventricular function appears to be normal. Therefore, clinicians should have a high index of suspicion for cardiac laminopathies. It can be hypothesised, that the amount of time it takes to progress from arrhythmias to conduction disorders or dilated cardiomyopathy can be used as a marker for prognosis in cardiac laminopathy cases. As such, monitoring these patients for any abnormalities in PR or QT prolongation on ECG can be useful in determining prognosis. The management of individuals change when their conduction deficits or dilated cardiomyopathy are due to LMNA mutations. In these groups of patients, even in the presence of normal ventricular function, placing an ICD improves their prognosis significantly.

**BLEEDING STOMAL VARICES: A MARKER FOR UNDERLYING LIVER PATHOLOGY.**

Khan O\*

Bart's and the London Hospital

**Introduction:** Portal hypertension (PHTN) is a rare complication of primary sclerosing cholangitis (PSC) secondary to ulcerative colitis and may cause oesophageal and parastomal varices. Bleeding from parastomal varices has been reported and is usually associated with PHTN. PSC is the second most common cause of PHTN following cirrhotic changes in the liver. Consequent variceal bleeding can lead to large volume blood loss and significant morbidity and potential mortality. Recurrent stomal bleeding in the absence of trauma is a rare occurrence and should prompt further investigations.

**Presentation of case:** We report a case of a 66-year-old gentleman who presented with stomal bleeding. His ileostomy was re-sited to the left iliac fossa but bleeding persisted. A diagnosis of PHTN was made on the basis of ectatic mesenteric veins on CT which were subsequently embolised.

**Discussion:** PHTN developed secondary to portal vascular and hepatic parenchymal changes. Management options include beta blockers (partially effective in this case) and transjugular intrahepatic portosystemic shunt (TIPS). The management option carry a risk of severe morbidity which need to be considered by each patient.

**Conclusion:** Recurrent stomal bleeding in patients with a history of UC should be investigated for portal hypertension. Both diagnosis and management can be challenging.

## UPPER EXTREMITY DEEP VEIN THROMBOSIS: A RARE CAUSE OF UPPER LIMB SWELLING.

Wu D\*, Dunkow P  
Blackpool Victoria Hospital, Lancashire, UK

**Background:** Upper extremity deep vein thromboses (UEDVT) are infrequent but responsible for one-tenth of all venous thrombotic events.

**Case report:** An 83-year-old male was admitted to orthopaedics for arthrotomy and washout of septic arthritis of his hip. Other than this, he suffered a three-week history of disabling right shoulder pain associated with ascending pitting oedema to the elbow. The patient was systemically well with no stigma of superior vena cava obstruction. The overlying skin was intact with no transdermal implants, trauma, phlebitis, or injection sites; and was non-tender to palpate. His radial and ulnar pulses were palpable bilaterally. There was no pallor of limb and capillary refill times were within two seconds at the nail beds. His sensation was intact across C3-T2 dermatomes and power grips were equivocal both sides. Musculoskeletal examination revealed limited active and passive external rotation of his right shoulder to 45 degrees. His blood parameters showed normal white cell counts but moderately elevated C-reactive protein and erythrocyte sedimentation rate. Both X-rays of his chest and shoulders were non-remarkable. Duplex ultrasonography, however, found occluded thrombus in patient's right brachial vein. The patient was treated with therapeutic dose of low-molecular weight heparin and had no pulmonary embolism one month following the diagnosis.

**Discussion:** Primary UEDVT represents a third of all cases which could be effort-induced or idiopathic. Patients with indwelling central venous catheters, especially in conjunction with malignancies or hypercoagulation disorders are at increased risk of secondary UEDVT. Pulmonary embolism could be as high as 36%. Complication also includes post-thrombotic syndrome which results in reduced venous return; hence incapacitating limb swelling, pain and ulceration.

**Conclusion:** The post-thrombotic syndrome of UEDVT could mimic the presentation of adhesive capsulitis. This however should be considered as a diagnosis of exclusion.

## INSULIN RESISTANT GENETIC DISEASE - ALSTRÖM SYNDROME: A CASE REPORT.

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Constanta County Hospital, Constanta, Romania.

**Introduction:** A 27-year-old female, presents with bilateral complete blindness; unilateral deafness; Obesity with BMI: 41.6, Increased upper body muscle mass; stiffness, dyspnea and hyper pigmentation of the skin.

**Case History:** She had Nystagmus, noted at 4 months old. She developed progressive retinal degeneration and infantile obesity: 16 kgs at 11 months old. At 10 years, she was blind with sensorineural hearing impairment. Initially diagnosed at 12 years with Non-Insulin Dependent Diabetes Mellitus but was recently diagnosed with Insulin dependent Diabetes Mellitus. Never had ketoacidosis. She has chronic "active" hepatitis, recurrent urinary tract infections, incontinence, scoliosis, kyphosis, acanthosis nigricans, normal secondary sexual characteristics with no menstruation, chronic obstructive pulmonary disease and gastroesophageal reflux disease.

**Investigations:** Laboratory tests showed increased levels of liver transaminases, hypercholesterolemia and hypertriglyceridemia. Cardiac Echography-Systolic dysfunction of the left ventricle was noted with diffuse hypokinesia. Genetic testing-Frame shift in one allele in axon 16 in the ALMS1 gene. Differential Diagnosis: Biedl-Bardet Syndrome; Wolfram Syndrome; Alström's Syndrome.

**Conclusion:** With genetic testing, showing a defect in the ALMS1 gene, we can conclude this patient has Alström Syndrome. There are about 500 documented cases world-wide. Alström Syndrome is a rare autosomal recessive genetic disorder which affects multiple organs. The ALMS1 gene is on chromosome

2p13. There is a need to educate doctors on the initial signs and symptoms to enable earlier diagnosis of patients with Alström syndrome in the future. In our patient, treatment includes: Recombinant growth hormone therapy; Hearing aids; statins and fibrates for dyslipidemia; Actos and Lantus for diabetes mellitus.

### PREVENTIVE OCCIPITOCERVICAL FUSION IN PATIENTS WITH KNIEST DYSPLASIA.

Rybus JJ\*, Drózd AM  
University Children's Hospital of Cracow

**Background:** Kniest dysplasia is a distinctly rare disorder (1:1,000,000 live births) caused by mutations in the COL2A1 gene, which forms type II collagen. It is inherited in an autosomal dominant pattern. Clinically the condition causes skeletal abnormalities, which are characterized by dwarfism, body dysproportion, kyphoskoliosis, excessive lumbar lordosis and joint degeneration. Cleft palate, hearing loss due to recurrent ear infections and eye problems are fairly common symptoms.

**Methodology:** The analysis of medical and radiological record of the treatment path between 1998 and 2012.

**Discussion:** Two 17-year-old female patients- monozygotic twins were treated at the Children's Hospital because of Kniest dysplasia (Spondyloepimetapyseal Dysplasia Congenita). Both of them have characteristic symptoms of this disorder: dwarfism, dysmorphic faces, excessive lumbar lordosis, genu varum and bilateral coxa's joint contracture. They were repeatedly hospitalized. The aim was to undergo a medical rehabilitation, which should have improved a motion function and muscle strength. In 2002 one of the twins had an accident. Due to the trauma complications the occipitocervical stabilization was performed. The same procedure was used in her sister treatment as a prevention. After 3 years the stabilizations were removed. In August 2011, the second accident happened and resulted the cranio-cervical junction trauma. The patient presented disorders of consciousness, respiratory failure and tetraplegia. Therefore, the second occipitocervical stabilization was performed.

**Case summary:** The presented case shows multiplicity of complications due to dysfunction of type II collagen. Wherefore, necessity of preventive occipitocervical stabilization should be considered in such cases.

### MANAGEMENT OF PREGNANCY COMPLICATED BY RIBOFLAVIN RESPONSIVE MULTIPLE ACYL-COA DEHYDROGENASE DEFICIENCY.

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Riboflavin Responsive Multiple Acyl-CoA Dehydrogenase Deficiency (RR-MAD) is a rare autosomal recessive metabolic condition in which the body is unable to utilise fats and protein for energy. Blood glucose levels can unexpectedly become extremely low and acid levels in the blood can increase. High dose riboflavin is the cornerstone of treatment and should be recommended with oral supplementation of carnitine. Knowledge of the disease and the impact it can have on pregnancy is of paramount importance. A 28-year-old women with RR-MAD presented as an emergency to the antenatal ward at 25+5 weeks unable to tolerate food and drink for couple of days. Blood glucose and ketones were reported and intravenous fluids commenced. Fetal movement was normal however there appeared to be no improvement and her conditioned deteriorated leading to hypotension. Intravenous 10% dextrose was commenced and carbohydrate intake monitored which alleviated her symptoms. Current pregnancy is positive for RR-MAD but expected to respond to riboflavin and/or carnitine supplements. However, a previous pregnancy was terminated due to severe form of RR-MAD and incompatibility with life. A high index of suspicion is needed in women with RR-MAD in order to follow the emergency protocol, as this condition can become life threatening if untreated. Patients themselves also need to be aware of when and how to seek medical attention, as was the situation in this case. Management of pregnancies with RR-MAD requires a multidisciplinary approach, including specialists in maternal-fetal medicine, genetics and dietetics.

## **MASSIVE HAEMORRHAGE CONTROL, ARE WE DOING IT RIGHT? A CASE REPORT ON UNCONTROLLED HAEMORRHAGE FOLLOWING FACIAL TRAUMA.**

Chan C\*  
Manchester Royal Infirmary

Severe trauma is a worldwide problem as it results in over five million deaths every year. Uncontrolled bleeding is the leading cause of death after a traumatic incident. Effective management of haemorrhage is heavily emphasized as this is a commonly faced situation not only in trauma but many other specialties. The Advanced Trauma Life Support classifies bleeding into 4 groups according to the extent of blood loss. This classification is widely used across multiple countries as an indicator on bleeding severity and when to instigate various treatments. However, it has been pointed out that this classification does not truly reflect how poorly a patient can be and is often unreliable. This paper hopes to explore the challenges faced when assessing haemorrhage severity, looking particularly at the inaccuracies encountered when relying upon common parameters such as vital signs, haemoglobin concentration and haematocrit concentration. Discussion will be based on a case of a 78 year old male who presented with uncontrolled facial haemorrhage after sustaining a blunt non penetrating trauma. An estimated 2.0 litres of blood were lost. Interestingly the patient was able to maintain vital signs and blood results were within normal limits. There will also be a focus on 'Cryptic Shock' which is difficult to identify, thus associated with increased mortality. Additionally, this paper hopes to advocate the importance of addressing 'The Lethal Triad' during massive haemorrhage control. The triad consists of three elements, namely acute coagulopathy, hypothermia and acidosis. These three factors contribute to a vicious cycle that leads to perpetuation of bleeding and patient deterioration. There will also be discussion over 'Permissive Hypovolemic Resuscitation' (PHR), which is a relatively newer approach to fluid administration during active haemorrhage. PHR aims to strike an optimum balance between maintaining adequate tissue perfusion while avoiding Trauma Associated Coagulopathy.

## **OSTEORADIONECROSIS OF THE TEMPORAL BONE FOLLOWING MIDDLE EAR SQUAMOUS CELL CARCINOMA: A SURGICAL CHALLENGE.**

Layton T\*  
University of Manchester

**Aims:** Squamous cell carcinoma of the temporal bone is a rare and destructive malignancy. It represents both a diagnostic and therapeutic challenge. This case reports aims to present an interesting and rare example of the significant sequelae that can follow treatment of SCC of the middle ear.

**Methods:** A 50-year-old patient was treated for a locally advanced SCC of the middle ear. She received a radical mastoidectomy with adjuvant radiotherapy.

**Results:** Seventeen years post-op there is no evidence of tumour recurrence. However, following radiotherapy of the temporal bone the patient developed osteoradionecrosis that periodically became infected. One episode of infection, two years after surgery, produced an infiltrating osteomyelitis of the temporal bone that led to the formation of a cerebellar abscess. This was treated with IV antibiotics and surgical drainage and the patient made a full recovery. At present the area of necrotic bone has a small sequestrum and has produced a chronically discharging ear that requires periodic micro suction and toileting.

**Conclusions:** This case reports illustrates how vital a close follow up is for patients, not only to detect possible recurrence of the malignancy but also to identify post-treatment complications. It provides a rare example of an intracranial abscess being produced from an area of osteoradionecrotic bone.

**A NOVEL CLINICAL ANATOMY TRAINING COURSE FOR MEDICALS STUDENTS AND FOUNDATION DOCTORS.**

Lim D\*  
University of Bristol

**Introduction:** This is an event taught by surgeons with the purpose of equipping both senior medical students and foundation year doctors with a solid knowledge of applied clinical anatomy. The course aims to bridge knowledge gap in applied anatomy and to produce anatomy trainers who can confidently teach anatomy to their peers.

**Methodology:** To provide the best interactive learning sessions for the attendees, the course adopts a demonstration approach to surface anatomy in order to illustrate relevant points to everyday clinical practice. Following the highly interactive focus group workshops, attendees were then required to sit for a formal assessment in the form of viva, OSCE and spotters. A minimum of 70% marks is needed to successfully complete the course. Certificate for level 1 will only be valid for 2 years from the date of passing the exam.

**Feedback:** This course has received very good feedback from majority of attendees. Some of the feedbacks included "An extremely useful day to summarise and clarify old anatomy knowledge", "This is the best course I have ever attended" and "For once anatomy is not taught in a boring way".

**Discussion:** Attendees were taught important anatomical landmarks that are commonly encountered in routine operations, different ways to place surgical incisions, fundamental principles and above all, structures to avoid or preserved when operating. Some of the topics that were covered in the course include soft tissue injuries and trauma to the upper limbs, facial and neck injuries, stab/gunshot wounds to the thorax/abdomen, wound healing, sutures, and local anaesthetics.

**Conclusion:** This course is highly recommended to all senior medical students and foundation doctors who are interested in human anatomy and a career in surgery.

**LEGAL HIGHS: TWO CASES, DRASTICALLY DIFFERENT OUTCOMES.**

Wooding EL\*, Kerr Liddell R  
Torbay Hospital

**Background:** Novel psychoactive substances called 'legal highs' constitute a new class of designer substances. Recorded usage is increasing 'legal highs' cause wide ranging physical and behavioural effects, from sympathetic nervous stimulation to psychosis.

**Case 1:** A 17-year-old male was brought in by ambulance (BIBA) with GCS of 6/15 and inadequate breathing having ingested 'sensate'. He required intubation and ventilation. ABG demonstrated profound respiratory acidosis. On examination extensor posturing was noted, but otherwise was unremarkable. CK was 232, and CT head was normal. He was admitted to ICU overnight, after which he was extubated and discharged, without follow-up required.

**Case 2:** A 15-year-old male was BIBA with GCS of 12/15, following a witnessed long-lie by his mother, having smoked 'bubble bud'. On examination he had left-sided weakness, hypertonia and hyperreflexia. CT and subsequent MRI scan demonstrated cerebral infarct. CK was 29413. He was under shared care of Paediatricians, Neurologists and the Stroke multidisciplinary team. His mother was charged with neglect. Following a long stay with 6 months multidisciplinary follow-up he was discharged to his father's residence.

**Discussion:** These cases highlight contrasting outcomes resulting from legal high use. Both patients presented with reduced consciousness but their initial presentation misaligns with long-term morbidity. Patient 1 experienced no known long-term consequences; it is still unclear whether patient 2 will recover fully. TOXBASE suggested both substances were Synthetic Cannabinoid Receptor Agonists. However,

differences in terminology between vendors and our inability to screen produces uncertainty.

**Conclusion:** To improve outcomes we must educate patients better about the risks of legal highs and address the training needs of frontline staff. Finally, we must share risk and management information inter-professionally through research and TOXBASE, increasing evidence within our healthcare community.

### **VENTING SPLEEN – AN UNUSUAL DIAGNOSIS FOR PLEURITIC CHEST PAIN.**

Parker C\*, Pulimood T  
West Suffolk Hospital, United Kingdom

A 52-year-old gentleman was found unwell and hypotensive. He had pleuritic chest pain, and vague abdominal pain which outpatient investigation had found no cause for (including a CT KUB for haematuria & polycythaemia). Initially septic, he stabilised with IV Tazocin and fluids. His pain persisted with increasing breathlessness, high d-dimer & CRP. A CTPA was organised to rule out a pulmonary embolus with superimposed infection; after discussion with the radiologist about the CRP we added abdominal views, which revealed a 7cm splenic abscess. Microbiology advised to continue Tazocin as the patient was stable. Over the weekend he developed severe sepsis with periodic fever spikes. Urgent discussion with the on-call radiologist & surgical team led to placement of an ultrasound-guided splenic drain (the surgical team's concern was the risk of rupture with splenectomy, and the radiology team were unhappy with the bleeding risk with simple aspiration). Blood cultures and aspirate grew *Streptococcus milleri*, and gentamicin was added. Further questioning revealed a 3-year history of an infected molar. Cardiology performed echocardiography to rule out endocarditis, and the maxillofacial team removed the offending tooth. The patient stabilised with conservative management and was discharged on oral clindamycin for 3 weeks. Splenic abscesses are an unusual cause for pleuritic pain, and can be difficult to diagnose. The infective organism was unusual, in that the patient did not have multi-organ involvement or underlying endocarditis. This case highlights the multidisciplinary nature of conservative management. Whilst the problem was ultimately a surgical emergency, Microbiology guided the antibiotics, an interventional radiologist inserted the drain, and care was coordinated by the medical team. Small case series suggest conservative management/drainage has equivalent outcomes to splenectomy, but there are no randomised trials. This rare diagnosis should be borne in mind if a source of sepsis cannot readily be identified.



*Category: Clinical Audit***HIV TEST REFERRALS IN MEDICAL PATIENTS - FULL CYCLE AUDIT.**Lemon TI\*  
York Hospital, United Kingdom

**Background:** HIV is prevalent in developing countries, yet the full extent remains unknown. Every available opportunity must be taken to test patients for HIV, improving their outcomes and protecting others. The gold standard in many developing country hospitals is 100% of medical patients whom are HIV negative should be tested if a test has not been carried out within the preceding months. We investigated this in a Ugandan hospital.

**Method:** Over three days two wards all patients on two medical wards has their case notes reviewed to see whether HIV tests had been requested. We excluded patients whom had a positive result already, or whom had had a test within the previous 3 months. Children of all ages were included. Intervention post audit was a clear poster placed on each ward reminding physicians to consider HIV test referral. The re-audit included 67 patients, with 67 having been tested.

**Results:** Of a total of 59 patients included in the pre-intervention audit, there were 12 whom had not been tested for HIV. This represented an 80% success rate. Four of these had been tested between 3-6 months ago, 5 were children under 1 year, over which there remains some controversy over whether to test. Three were clear misses. Following our implementation, 67 patients were included to audit its success, and all of these patients had been tested, giving a 100% test rate.

**Conclusion:** Our simple intervention meant that the gold standard was met. We would advocate use of signs to remind physicians to test for HIV in all HIV prevalent areas. Importance of re-audit and maintenance of the signs encouraging HIV test consideration need to be highlighted. This full audit cycle was a success.

**AUDIT OF THE EPISIOTOMY PRACTICE IN HOSPITAL SULTAN ISMAIL (HSI), MALAYSIA.**Tembo T\*  
Hospital Sultan Ismail, Malaysia

**Background:** The Malaysian Ministry of Health has stipulated that less than 30% of the total number of vaginal deliveries in local hospitals require an episiotomy, the surgical incision made during labour to ease fetal delivery.

**Aims:** 1. To determine whether the recommended episiotomy protocol is practiced in HSI by calculating the rate of episiotomies conducted in primigravidas (women's first pregnancy). 2. To identify birth attendants conducting the episiotomies. 3. To report any complications following the procedure.

**Methods:** A prospective, 4-week audit was conducted in HSI's labour ward by identifying all episiotomies conducted in primigravidas delivering vaginally.

**Results:** Out of a total 289 vaginal deliveries in primigravidas, 194 episiotomies were conducted, resulting in an episiotomy rate of 67.1%. Nurses and senior doctors conducted 38% and 30% of these episiotomies respectively; midwives and house officers conducted 19% and 13% respectively. Complications included bleeding (6.7%), perineal tears (4%) and vaginal wall tears (2.5%).

**Conclusion:** HSI's episiotomy rate is more than twice the recommended practice. Variation in training of birth attendants and poor knowledge of hospital protocol may explain this finding. As the department does not publish their episiotomy rate, staff may be unaware of their current practice. Therefore, to reduce the current episiotomy rate further research into staff awareness of hospital protocol is required. Furthermore, birth attendants should be trained on the absolute indications for episiotomies to avoid complications. This audit should be repeated for the department to monitor progress in achieving the recommended guideline.

## SCREENING FOR RETINOPATHY OF PREMATURITY (ROP): CURRENT GUIDELINES AND IDENTIFICATION OF HIGH-RISK GROUPS.

McDonald M\*, Dhar A  
Norfolk and Norwich University Hospital

**Background:** Early detection and treatment of retinopathy of prematurity (ROP) can prevent devastating consequences in newborns. The Royal College of Ophthalmologists' guidelines suggest that high-risk groups (<32 weeks gestation at birth or <1,501 grams) must be screened at appropriate intervals to avoid unnecessary allocation of resources and irreversible vision loss.

**Methods:** This audit evaluated the screening of ROP in babies admitted to the Norfolk and Norwich University Hospital's Special Care Baby Unit during the 2012 calendar year using their electronic patient database. Search Criteria: Either <1501g or <32 weeks gestation at birth. This was cross-referenced with ophthalmology notes and patient notes. There were 105 patients in total included in this audit.

**Results:** Based on the Royal College's screening criteria, outcomes included the appropriate frequency, termination, and follow-up of detection. Of the 69 babies examined, 9 were screened too late, and 21 too early. 28% (10/36 patients transferred) did not have ROP screening mentioned in their transfer documents. 11% of parents (105 patient cohort) were also not informed of the screening process.

**Discussion/Conclusion:** This audit highlights realities in practice of which other regional health trusts must be aware. The identification of high-risk babies upon admission (i.e. those being transferred or discharged early) cannot be overlooked. This is particularly important for junior doctors and those on neonatal rotation, as it is a condition largely neglected by undergraduate medical curriculums. Adherence will avoid the loss of what we take for granted every day: our vision.

## AXILLARY NODE CLEARANCE DOES MORE HARM THAN BENEFIT?: A 2-YEAR RETROSPECTIVE STUDY IN EARLY BREAST CANCER PATIENTS.

Chew P\*, Olayinka O  
Barnsley District Hospital

**Background:** Complete axillary node clearance (ANC) is the current gold standard of management in breast cancer patients with diseased lymph nodes found on axillary staging. ANC is effective in controlling regional disease. However, this is associated with multiple surgical morbidities, especially lymphoedema that has a significant impact on patient's quality of life.

**Methodology:** We report a 2-year retrospective study of complete ANC in breast cancer patients whom found to have positive lymph nodes on sentinel lymph node biopsy (SLNB) or axillary sampling (AS). The aim was to assess the clinical need of ANC in diseased axilla via identifying further positive nodes post axillary staging, and to account for future breast cancer patient's management planning within local trust.

**Results:** We have found that an average of 25% patients have positive nodes identified post-SLNB and AS. Furthermore, only 16% of positive nodes were found in post-SLNB arm. Hence, at least 75% of patients have negative nodal status on ANC.

**Discussion:** SLNB has become the standard approach for axillary staging and replacing axillary sampling, therefore the number of patients with diseased lymph nodes in ANC will further reduce. Recent multi-centred trials and international studies have also shown that ANC have no significant benefits in disease survival rate and regional relapse prevention. The development of complications especially lymphoedema is twice as high in ANC compared to axilla-conserving therapies. The clinical advantages of ANC is questioned.

**Conclusion:** In summary, this audit suggested that majority of breast cancer patients did not benefit from complete axillary clearance after SLNB or AS, and were possessed to avoidable surgical morbidities that might have a significant impact on their quality of life.

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York Hospital, United Kingdom

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**Results:** Out of a total 289 vaginal deliveries in primigravidas, 194 episiotomies were conducted, resulting in an episiotomy rate of 67.1%. Nurses and senior doctors conducted 38% and 30% of these episiotomies respectively; midwives and house officers conducted 19% and 13% respectively. Complications included bleeding (6.7%), perineal tears (4%) and vaginal wall tears (2.5%).

**Conclusion:** HSI's episiotomy rate is more than twice the recommended practice. Variation in training of birth attendants and poor knowledge of hospital protocol may explain this finding. As the department does not publish their episiotomy rate, staff may be unaware of their current practice. Therefore, to reduce the current episiotomy rate further research into staff awareness of hospital protocol is required. Furthermore, birth attendants should be trained on the absolute indications for episiotomies to avoid complications. This audit should be repeated for the department to monitor progress in achieving the recommended guideline.

## SCREENING FOR RETINOPATHY OF PREMATURITY (ROP): CURRENT GUIDELINES AND IDENTIFICATION OF HIGH-RISK GROUPS.

McDonald M\*, Dhar A  
Norfolk and Norwich University Hospital

**Background:** Early detection and treatment of retinopathy of prematurity (ROP) can prevent devastating consequences in newborns. The Royal College of Ophthalmologists' guidelines suggest that high-risk groups (<32 weeks gestation at birth or <1,501 grams) must be screened at appropriate intervals to avoid unnecessary allocation of resources and irreversible vision loss.

**Methods:** This audit evaluated the screening of ROP in babies admitted to the Norfolk and Norwich University Hospital's Special Care Baby Unit during the 2012 calendar year using their electronic patient database. Search Criteria: Either <1501g or <32 weeks gestation at birth. This was cross-referenced with ophthalmology notes and patient notes. There were 105 patients in total included in this audit.

**Results:** Based on the Royal College's screening criteria, outcomes included the appropriate frequency, termination, and follow-up of detection. Of the 69 babies examined, 9 were screened too late, and 21 too early. 28% (10/36 patients transferred) did not have ROP screening mentioned in their transfer documents. 11% of parents (105 patient cohort) were also not informed of the screening process.

**Discussion/Conclusion:** This audit highlights realities in practice of which other regional health trusts must be aware. The identification of high-risk babies upon admission (i.e. those being transferred or discharged early) cannot be overlooked. This is particularly important for junior doctors and those on neonatal rotation, as it is a condition largely neglected by undergraduate medical curriculums. Adherence will avoid the loss of what we take for granted every day: our vision.

## AXILLARY NODE CLEARANCE DOES MORE HARM THAN BENEFIT?: A 2-YEAR RETROSPECTIVE STUDY IN EARLY BREAST CANCER PATIENTS.

Chew P\*, Olayinka O  
Barnsley District Hospital

**Methodology:** We report a 2-year retrospective study of complete ANC in breast cancer patients whom found to have positive lymph nodes on sentinel lymph node biopsy (SLNB) or axillary sampling (AS). The aim was to assess the clinical need of ANC in diseased axilla via identifying further positive nodes post axillary staging, and to account for future breast cancer patient's management planning within local trust.

**Results:** We have found that an average of 25% patients have positive nodes identified post-SLNB and AS. Furthermore, only 16% of positive nodes were found in post-SLNB arm. Hence, at least 75% of patients have negative nodal status on ANC.

**Discussion:** SLNB has become the standard approach for axillary staging and replacing axillary sampling, therefore the number of patients with diseased lymph nodes in ANC will further reduce. Recent multi-centred trials and international studies have also shown that ANC have no significant benefits in disease survival rate and regional relapse prevention. The development of complications especially lymphoedema is twice as high in ANC compared to axilla-conserving therapies. The clinical advantages of ANC is questioned.

**Conclusion:** In summary, this audit suggested that majority of breast cancer patients did not benefit from complete axillary clearance after SLNB or AS, and were possessed to avoidable surgical morbidities that might have a significant impact on their quality of life.

**BASIC SURVEILLANCE FOR CARDIAC ABNORMALITIES IN PATIENTS WITH SAH: WHAT IS THE CURRENT PRACTICE?**

Al-Othman S\*, Harrison O, Foster R, Mc Alister J, Davies B  
Salford Royal Foundation Trust

**Introduction:** Patients suffering from a Subarachnoid Haemorrhage [SAH] are at increased risk of cardiac dysfunction. Studies have estimated 27-100% of patients are affected (Chatterjee 2013). Patients may be asymptomatic. We review the current usage of ECG and Troponin in SAH patients.

**Method:** Retrospective audit of ECG and troponin use in patients admitted with SAH over 1 year (N=226). Timing of Ictus and admission along with ECG and Troponin results were noted. Analysis of Variance was used to compare ECG and initial troponin findings with time from ictus. Chi-squared was used to compare elevated troponin or a troponin rise with ECG findings.

**Results:** ECGs were performed in 111/226 (49.1%), of which 78/111 (70.2%) were normal. The majority were performed on admission; 94/111 (85%). Bundle branch block was the most common abnormality 13/111 (11.7%). ST segment changes were only seen in 4/111 (3.6%). A troponin test was taken in 82/226 (36.3%). 69/82 (84%) were elevated ( $>3$ ). 32/62 (46%) had repeated troponin. All repeated troponin showed dynamic changes. Only 4/32 (12.5%) had a significant rise, for which 2/4 (50%) had normal ECGs. The incidence of ECG abnormalities or value of troponins did not vary with time ( $p>0.05$ ). An elevated troponin or troponin rise did not predict an abnormal ECG ( $p>0.05$ ).

**Conclusion:** Troponin and ECGs are not routinely performed in SAH patients but may be abnormal. Troponin values are difficult to interpret and their significance is unclear. SAH patients are generally young and unknown to the tertiary neurosurgical centre, arriving with no indication of cardiac baseline and likely to require general anaesthesia for aneurysm protection. Routine ECG on admission may provide an assessment of cardiac baseline, essential to their ongoing care.

**FASCIA-ILIACA COMPARTMENT BLOCK AUDIT FOR PATIENTS PRESENTING WITH FRACTURED NECK OF FEMUR.**

Sheppard S\*, Sreekumar P  
Nevill Hall Hospital, Abergavenny

Fractured neck of femurs are a common injury in the adult population, particularly those aged over sixty five years (median age 84 years) with high morbidity and mortality rates. Analgesia is addressed by a multi-modal approach, including fascia-iliaca compartment block. Fascia-iliaca compartment blocks are an effective and relatively simple analgesia technique. This audit examined the documentation and practice standards of fascia-iliaca compartment blocks administered for fractured neck of femur patients admitted to Nevill Hall Hospital. Case notes and theatre records were reviewed retrospectively for a four month period (November 2013 – February 2014) identifying patients admitted with fractured neck of femurs. The Association of Anaesthetists of Great Britain and Ireland (AAGBI) minimum standards for regional anaesthesia was the audit standard. 69 admissions identified, of whom 48 (69.6%) had fascia-iliaca compartment blocks for analgesia. These were performed by orthopaedic, emergency department and anaesthetic doctors. 16 (33.3%) had consent documented, 24 (50.0%) did not have the dose (volume & concentration) of local anaesthetic recorded, 1 (2.1%) had documented monitoring of observations during and post-procedure and 13 (27.1%) mentioned that the pain score had been re-assessed. This audit demonstrates that documentation of fascia-iliaca compartment blocks does not meet the expected standard which compromises patient safety and has implications when administering further regional anaesthetic techniques. The omission of monitoring may indicate an under-appreciation of the risks of this regional anaesthetic block. The action plan is to educate practitioners, organise local anaesthetic toxicity simulation scenarios and create a protocol for administering fascia-iliaca compartment blocks.

## INTENTIONAL AND ACCIDENTAL OVERDOSES IN THE ELDERLY.

Hepworth GV\*, Dear J, Morrison E  
Royal Infirmary of Edinburgh

**Background and aims:** Self-poisoning is one of the most common presentations to acute hospital services in the UK. Although the risk of suicide increases with age and accidental overdoses make up a substantial percentage of self-poisoning presentations, there is very little research looking at the acute care and outcomes of intentional and accidental overdoses in patients over the age of 65. This study aimed to determine whether patients over 65 with accidental overdoses stay in acute services longer, die sooner or are more likely to have dementia than patients over 65 who had intentionally overdosed.

**Methodology:** A retrospective study analysing overdose admissions to A and E in The Royal Infirmary of Edinburgh in patients over the age of 65 from 2003-2013.

**Results:** Over the study period there were 148 accidental overdoses and 487 intentional overdoses admitted that fitted the inclusion criteria. There was no significant difference between intentional and accidental overdoses regarding length of stay in acute services, one year mortality and the prevalence of dementia.

**Conclusions:** The results show no significant difference in acute care, cognitive comorbidity or outcomes between the two groups presenting with overdose. However, our results highlight factors that may bias the interpretation of these results, including crucial differences in immediate management and longer-term outcomes of the two groups (intentional overdose patients received a psychiatric review while accidental overdoses did not, intentional overdoses were likely to have repeat overdose admissions unlike accidental overdoses). These considerations have highlighted areas and approaches for further research in this area.

## ENHANCED RECOVERY PROGRAMME FOR WOMEN DELIVERING BY ELECTIVE CAESAREAN SECTION.

Brock G\*, Hughes P  
St. Georges Hospital

**Aims & Objectives:** The Enhanced Recovery Programme (ERP) has been implemented to improve care for patients undergoing surgical procedures. The main elements this programme can be extended to patients undergoing elective caesarean sections. We have formulated and distributed a questionnaire to patients which addresses pre-operative assessment, reducing physical stress, peri-operative management, and early mobilisation. Our aim is to establish patient satisfaction and adherence to the ERP to close the audit cycle.

**Methodology:** The sampled data included women undergoing Elective Caesarean Section at SGH between 19/9/2013 and 15/11/2013. Those undergoing Emergency Caesarean Section were not sampled. Women were given a questionnaire to complete at the end of their stay in hospital. All data was kept anonymous.

**Results:** Twenty-four questionnaires were completed and processed. Two questionnaires were incompletely filled out. 72 were completed and processed in 2012. We found in this cycle, 50% women had their first drink within 30 mins after their operation, compared to 11% in 2012. 67% women cited their pain control as excellent compared to 50% in 2012. However, the majority of women first mobilised from bed >14hrs after their operation. The main reason for this being catheter and drip still in place. There is a significant improvement in length of stay: now 33% women go home on day 1 post procedure, compared to just 4% in 2012. The majority of free comments were positive for staff with only some criticisms.

**Conclusions and Actions:** There is adherence to the ERP and improvements since the previous year, particularly timing of first drink after procedure. Changes still need to be made regarding patient mobilisation. Further follow up in the community is planned, and we aim to extend the ERP to emergency Caesarean Section. Barriers to early mobilisation will be explored with staff involvement and education.

**THE USE OF THE CHA2DS2-VASc AND HAS-BLED ACRONYMS IN THE MANAGEMENT OF ATRIAL FIBRILLATION IN A DISTRICT GENERAL HOSPITAL.**

Sen G\*

Royal United Hospital, Bath, UK

**Background:** Atrial fibrillation (AF) is the commonest cardiac arrhythmia increasing the risk of stroke fivefold. Guidelines from the European Journal of Cardiology recommend the use of CHA2DS2-VASc and HAS-BLED scores to decide on thromboprophylaxis. The CHA2DS2-VASc tool recommends that patients scoring 0 should not be anti-coagulated; a score of 1 should receive aspirin or anticoagulation and scores of  $\geq 2$  should be anti-coagulated. Patients with HAS-BLED scores of  $\geq 3$  are at a greater risk of bleeding.

**Methodology:** Using the aforementioned guidelines the aim was to assess whether the CHA2DS2-VASc and HAS-BLED acronyms were being used in decision making towards thromboprophylaxis. Data was collected retrospectively from patients' notes presenting with a diagnosis of AF.

**Results:** Data was obtained from 60 patients. 13% had a CHA2DS2-VASc score documented. There were five patients with a score of 0 and none were anti-coagulated. Eight patients had a score of 1 of which 63% were anti-coagulated. 39 patients had a score of  $\geq 2$  of which 83% were anti-coagulated. The HAS-BLED score was not documented once.

**Discussion:** The five patients scoring 0 were appropriately not anti-coagulated. Three out of eight patients (37%) with a score of 1 were not anti-coagulated, predisposing them to thrombo-embolic disease. The compliance with standards was better in patients with a score of  $\geq 2$  (83%), but taking into consideration factors such as patient preference and contraindications due to bleeding the compliance rate increased to 98% in this group. Whilst the CHA2DS2-VASc tool is well established, the HAS-BLED is less recognised. There is reluctance to anti-coagulate patients due to fears regarding bleeding but greater understanding of the HAS-BLED acronym should help to reassure clinicians.

**Conclusion:** In spite of a lack of documentation of CHA2DS2-VASc scores, anticoagulation rates were impressive. The HAS-BLED tool was underused but is essential to enable clinicians to anti-coagulate patients safely.

**AN AUDIT AND COMPARATIVE STUDY ON PATIENT SATISFACTION AND CLINICAL OUTCOMES OF IMMEDIATE VERSUS DELAYED LATISSIMUS DORSI (LD) RECONSTRUCTION.**Kataria V\*, Ramachandran R  
University of Manchester, UK

**Background:** This audit was carried out as part of on-going clinical governance in the surgical department as Royal Albert Edward Infirmary, Wigan. The primary aim was to assess whether satisfaction in patients undergoing latissimus dorsi flap breast reconstruction was meeting standards as compared to previously published studies, and whether there was any difference between delayed or immediate reconstruction. In addition, we aimed to evaluate whether the breast reconstruction service was meeting recommendations set out by NICE and BAPRAS with respect to patient information and decision making.

**Methods:** Patients who had undergone LD flap reconstruction were identified through coding data and patient medical records. Demographic data on operation dates, complications and co-morbidities was collected from patient medical records. Patients completed an extensive telephone questionnaire on satisfaction and functional effects following breast reconstruction. Results were tabulated and comparisons between immediate and delayed reconstruction for a variety of outcomes were made.

**Results:** Overall satisfaction was rated very highly amongst both groups of patients (reported using visual analogue scale); however, patients who underwent delayed reconstruction had significantly higher overall satisfaction compared to those who underwent immediate reconstruction ( $P=0.044$ ). Patients reported they received sufficient information and support in order to make informed decisions.

**Conclusion:** Both immediate and delayed LD flap reconstruction after mastectomy yielded high levels of patient satisfaction post-operatively. Surgeons at Royal Albert Edward Infirmary Wigan are meeting standards in patient satisfaction as compared to previously published data. In addition, we are following NICE & BAPRAS recommendations regarding decision making in breast reconstruction.

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#### **SONOVUE (SULPHUR HEXAFLUORIDE MICROBUBBLES) CLINICAL AUDIT.**

Mcallister N\*, McNeill A, Hoare T  
Newcastle upon Tyne Hospitals NHS Foundation Trust

**Introduction:** SonoVue is an ultrasound contrast agent consisting of sulphur hexafluoride microbubbles which improves display of the blood vessels thus allowing more specific characterisation of liver lesions. NICE guidelines (2012) recommend the use of SonoVue to characterise incidentally detected focal liver lesions, focal lesions in a cirrhotic liver and investigate potential liver metastases. The guidelines advise that this should be performed at the first presentation to ultrasound where possible.

**Methodology:** Retrospective review of contrast-enhanced ultrasound scans (CEUS) performed between April – September 2013 in two centres offering this service.

**Results:** 41 CEUS were identified in the first audit round. 46% of the cases were newly presented cases with incidental liver lesions on unenhanced ultrasound. 26% of these cases offered CEUS at the same appointment or within a 7-day return local policy. 74% of cases had a delayed CEUS with the medium delay of 2 months (range 0-5). Action plan included staff training and production of the "Focal liver lesion ultrasound pathway" flowchart displayed in the ultrasound scanning rooms to remind of the current guidelines.



**Discussion:** A re-audit was conducted (October 2013-March 2014). 62 CEUS were identified. 48% of the cases were newly presented cases with incidental liver lesions on unenhanced ultrasound. There was a much improved compliance rate of 67% with CEUS being offered at the same appointment or within a 7-day return local policy. 33% of cases had a delayed CEUS with the medium delay of 3 months (range 0-9). A repeat audit will be carried out in 6 months to assess the maintenance of standards.

### **AUDIT ON THE MANAGEMENT OF POSTPARTUM HAEMORRHAGE (PPH) AT THE ROYAL LONDON HOSPITAL.**

Nagenthiran SP\*, Khan FJ  
Royal London Hospital

**Introduction:** PPH is the leading cause of maternal mortality and a major cause of maternal morbidity. Primary PPH is defined as blood loss greater than 500mls within 24 hours after delivery. Major primary PPH is blood loss of 1,000mls or more within the same period. The Royal London Hospital audits all of its cases of primary PPH of 1,500mls or greater to identify areas for improvement.

**Methods:** All patients with a primary PPH of 1,500mls or more were identified from all deliveries that took place from 1st April to 30th September 2013 at Royal London Hospital. Data was extracted retrospectively from patients' notes and entered into an audit proforma, designed to collect data pertinent to maternal age, parity, risk factors of PPH and treatment interventions. The data was then analysed using Excel.

**Results:** For the defined period there were a total of 2,325 births. Fifty-eight cases satisfied the criteria of the audit of which 54 (93%) were audited. The prevalence rate of primary PPH of 1,500mls or greater was 2.5%. Three women suffered a primary PPH greater than 5,000mls. 63% of the patients were of Asian origin. 74% of patients were either primigravida (43%) or had a parity of 1 (31%). 54% of the patients had a Caesarean-section, of these, 72% had an emergency Caesarean-section. 44% did not have hourly urine output monitoring.

**Conclusion:** Caesarean section is a known risk factor for PPH and appears to be a particularly significant risk factor in this group, with emergency caesareans carrying a greater risk. Although research shows multiparity is a risk factor for PPH, our audit interestingly suggests that a reduced parity may also be a risk factor. In light of our findings further research needs to be conducted to determine whether reduced parity is indeed a risk factor for PPH.

### **AN AUDIT OF IMPLEMENTATION OF DELAYED CORD CLAMPING PROTOCOL AT PRINCESS OF WALES HOSPITAL**

Hunt C\*, Rushworth F  
Princess of Wales Hospital, Bridgend, Wales

**Background:** There has been a national shift from early cord clamping to delayed cord clamping (DCC). DCC was endorsed in the Guidance for Management of Third Stage of Labour Policy at Princess of Wales hospital (POWH) eighteen months prior to audit. The purpose was to explore staff attitudes and practises affecting compliance following the change.

**Objective:** To audit DCC in POWH, as recommended in the Guidance for Management of Third Stage of Labour Policy.

**Method:** Retrospective analysis of the first 35 deliveries of March 2013. Two semi-structured questionnaires explored opinions on DCC of the maternity staff and mothers.

**Results:** DCC was recorded in 100% of instrumental delivery (ID) and caesarean section (CS) records, and recorded in 0% of normal labour pathway records (NLP). DCC was implied in 89% of NLP records by midwives recording syntometrine administration >1 minute post-delivery. Maternity staff interviews revealed unanimous agreement of DCC and its documentation. Interviewing mother's found they were content with best outcome for baby, with most being unable to remember being told about DCC.

**Conclusions:** The DCC guideline has been successfully implemented. NLP records are intended to minimise documentation, but currently don't prompt for inclusion of details of cord clamping practise, resulting in it not being specifically documented. Recommendations: Altering of NLP to include space for documenting DCC, strengthening the clarity and support of the document for midwives. The audit has caused an overhaul of NLP, and also a document advising on correct practise of syntometrine administration. The audit has changed the way POWH practises and added clarity on DCC.

## LOWERING AND MONITORING SERUM URATE LEVELS IN GOUT

Ahmed M\*  
St George's University of London, United Kingdom

**Objective:** Are gout patients, treated with Allopurinol at Furnace Green Surgery, having their serum uric acid (SUA) levels tested and treated to target according to latest guidelines?

**Relevance:** Long-term maintenance of low SUA concentrations prevents development of gout complications, with Allopurinol being first-line treatment. Standard: No definitive guideline relating to gout. BSR, BHPR recommend target SUA =360µmol/l. NICE CKS recommends gout patients on Allopurinol have SUA levels checked every 3 months in first year, annually thereafter.

**Criteria:** =80% have SUA =360µmol/l. =90% have had SUA checked within last year (3/12/12 – 3/12/13). If SUA not within target, a plan should be noted >90%. Inclusion: Age =18, male/female, past history of gout +/- acute gout flare up in past 12 months (3/12/12 – 3/12/13).

**Exclusion:** first gout presentations in past 12 months. Method: This is a retrospective study. Patient data was obtained using Crosscare system; following codes were used, X40PQ (Gout), NO23 (Gouty Arthritis), C340 (Gouty Arthropathy), X702U (Gouty Tophus), I442 (H/O Gout). Search criteria included 'Allopurinol' in 'Repeated' drugs. Data was analysed in Microsoft Excel.

**Results:** Seven thousand patients registered, 187 (2.7%) had gout. Of these, 48 (25.7%) were prescribed Allopurinol from which 14 (29.2%) had SUA monitored within last year. 3 (21.4%) had SUA within target, 5 (35.7%) had flare up within last year and an action recorded. 15 patients (31.3%) currently prescribed Allopurinol had no record of SUA levels.

**Discussion:** The results fall below standard. Dosing Allopurinol appears to happen as a sole event and SUA is used diagnostically rather than measuring treatment efficacy. Recommendations include a copy of BSR guidelines placed in consultation rooms for guidance, a system highlighting Allopurinol review on software would be an excellent remainder to repeat SUA test and to re-audit in December 2014.

## REVIEW OF PNEUMOCOCCAL VACCINATION STATUS IN PAEDIATRIC COCHLEAR IMPLANT RECIPIENTS.

Kang M\*, Mathew R  
St. George's Hospital, United Kingdom

**Background and Aims:** Children with cochlear implants (CI) are at higher risk of acquiring pneumococcal meningitis. It is important to ensure that that these children are appropriately vaccinated. National guidelines in relation to meningitis vaccination are complex and changed in 2011. We therefore conducted an audit to determine whether children on our CI programme were optimally vaccinated by their General practitioners and also looked at ways of improving compliance. Results are compared to a previous audit.

**Method:** Paediatric patients who had their cochlear implants from July 2011 to October 2013 were selected for the audit. The data collected included whether the implants were inserted bilaterally or unilaterally, age at implantation, date and type of pneumococcal vaccination.

**Results:** Fifty-two percent of patients were optimally vaccinated at the time of cochlear implantation. Fifty-five percent of the patients were optimally vaccinated at the time of censorship. Optimal vaccination was achieved less commonly in children undergoing unilateral implants. The most common cause of sub optimal vaccination was failure to administer the 23-valent polysaccharide vaccination.

**Conclusion:** In comparison to the result of the previous audit, an increased proportion of patients were optimally vaccinated against streptococcus pneumoniae. However significant further improvement is still required. We present methods of improving vaccination compliance and intend to complete the audit cycle again following this.

#### **COMPARISON OF END OUTCOME AS CALCULATED BY LOCAL MODIFIED EARLY WARNING SCORING SYSTEM (MEWS) AND NATIONAL EARLY WARNING SCORING SYSTEM (NEWS) IN A SCOTTISH DISTRICT GENERAL HOSPITAL.**

Dissanayaka S\*, Hii S, Sneddon S, Prasad K  
University Hospital Ayr, United Kingdom

Various Early Warning Scoring systems exists to efficiently identify and respond to patients who are acutely unwell. These systems calculate a "score" using a combination of physiological parameters such as respiratory rate, oxygen saturations, blood pressure, pulse rate and temperature that are monitored during patient observations by nursing staff ("obs"). Score is linked to a response whether this be re-check in 12 hours or immediate review by a senior member of the medical team. In England Royal college of physicians (RCP) has developed and recommended the use of single early warning system called National Early Warning Score (NEWS). RCP states that aside from the advantages of having a standardised system across all NHS trusts, NEWS score provides an enhanced level of surveillance and clinical review of patients who are at risk of clinical deterioration. In Scotland various trusts are using locally developed early warning systems. Currently NHS Ayrshire and Arran uses a system called Modified Early Warning Score (MEWS). We aim to compare the end outcomes of using our local MEWS system to NEWS system. 500 MEWS scores as calculated by nursing staff for medical inpatients were noted. Physiological parameters that combined to make these scores were then plotted on standardised NEWS scoring chart to obtain the equivalent NEWS score. This score was then used to postulate what the end outcome would be. This was intern compared to what the end outcome was when the MEWS score originally calculated by nursing staff. As far as we are aware this is the first time such a comparison has been carried out in a Scottish hospital. We discuss the differences in end outcome from the two scoring systems and the implications of using NEWS score in a Scottish district general such as ours.

#### **COGNITIVE ASSESSMENT OF ELDERLY INPATIENTS: A CLINICAL AUDIT.**

Shermon E, Vernon L\*, McGrath A  
University of Birmingham/Russells Hall Hospital, United Kingdom

**Background:** Previous research has shown that comprehensive geriatric assessment including cognitive assessment results in better outcomes and improved quality of life for elderly inpatients. The National Audit of Dementia revealed that too few patients were being assessed for cognitive function and were therefore failing to receive adequate care. Consequently, recommendations were made to improve implementation of cognitive assessment.

**Methods:** Retrospective clinical audit in a district general hospital. Data was collected via systematic sampling of clinical records of 50 inpatients on an elderly care ward. Descriptive analysis of results was then performed.

**Results:** Despite guidelines suggesting that cognitive assessment should be performed on admission, we found this was only documented in 22% of medical notes. However, 56% of patients received some form of cognitive assessment by discharge. Although these figures appear disappointing, in comparison with the

National Audit of Dementia (which found mental status was only assessed in 50% of patients by discharge) a small improvement is apparent. The most commonly used assessment tool was the Abbreviated Mental Test 10. Assessment completion was independent of gender or level of independence, but was only performed in patients over age 75. In those assessed, 75% were found to have some level of cognitive impairment and 36.8% received a new or suspected diagnosis of dementia.

**Discussion:** Our results demonstrate that despite the National Audit of Dementia highlighting the need to improve cognitive assessment rates, practice in this area is still poor and further emphasis on performing assessment is necessary. Our findings support the need for increased education regarding the importance and benefits of cognitive assessment, as well as how to complete and document the assessment correctly.

**Conclusion:** Cognitive assessment continues to be poorly performed. Since assessment leads to better outcomes in dementia, doctors should be encouraged to perform assessments to improve patient care.



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