



*Special Edition*

# WJMER

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## Abstracts from Doctors Academy Events:

'Winner of Winners' presentations -  
5<sup>th</sup> International Medical Summer School, 2013

3<sup>rd</sup> International Academic and Research Conference, 2013

- Dental-derived Stem Cells and Whole Tooth Regeneration: An Overview

- A Career in Child and Adolescent Psychiatry

- Post Operative Surgical Care



- Ulceration of the Lower Limb: An Introduction to Medical and Surgical Intervention



## Selected best articles from 2012-13

Antigen Microarrays for Rapid Screening of Rheumatoid Arthritis and Other Autoimmune Diseases

Stem Cell Treatments for Huntington's Disease

Operating Theatre: Essential Concepts and Procedures

The Use of Geometric Morphometrics as a New Method to Analyse Glenoid Bone Loss after Shoulder Dislocation

Role of Cloud Computing in the Provision of Healthcare

Management of Major Trauma: A Malaysian Perspective

## Oral Presentations

*Clinical and Laboratory-Based Research Category***Does virtual reality simulation (VRS) training at home improve trainee confidence and self-reported ability?**<sup>1</sup>Barnes J; <sup>2</sup>Burns J\*; Nesbitt C; Horgan A<sup>1</sup>Royal Victoria Infirmary, Newcastle, UK; <sup>2</sup>Freeman Hospital, Newcastle, UK

**Introduction:** Surgical training is evolving. Tighter working times, more technically demanding techniques and increasing patient expectations can inhibit trainees gaining procedural experience. Virtual reality simulation (VRS) allows trainees to practice surgical technique outside of the operating theatre; helping them develop their skills and understanding and ensuring they get the most of time spent in theatre. However, the complexity and expensiveness of most VRS units can limit trainees opportunities to use them. This study investigated whether using SimEndo®, a portable VRS system for out of hospital use, could be a simpler alternative to conventional simulators.

**Methods:** Ten trainees were given a questionnaire which, using visual analogue scales, assessed their self-reported laparoscopic surgery competencies. They were asked about instrument and camera skills, tissue-handling, manual-dexterity, visuo-spatial awareness, depth awareness and overall confidence/ability. They were then given the SimEndo® unit to practice with in their own time before they were asked to reassess their confidence and self-reported ability in the different areas.

**Results:** Trainees spent an average of 196 minutes practicing (range 130-330) and reported a mean increase in overall confidence/ability of 93.9% (p=0.006). Improvements were reported in all domains, all bar one (camera skills) were statistically significant (p<0.05).

**Conclusion:** This study shows that portable VRS training improves trainees' surgical skills without requiring them to attend specialist centres. Further study, with objective assessment parameters is required to assess whether this method of learning may be a viable alternative to conventional simulation training.

**The use of adrenaline and long-term survival in cardiopulmonary resuscitation (CPR) following cardiac arrest**

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**Background:** Adrenaline continues as primary pharmacotherapy following cardiac arrest as instructed by international Advanced Life Support (ALS) guidelines. Adrenaline increases peripheral vascular resistance, through alpha-1-adrenoreceptor mediated vasoconstriction, whilst cardiac output is improved via adrenaline's beta-1-adrenoreceptor activity. This works to increase both coronary, and cerebral, perfusion pressure, with the anticipation of return of spontaneous circulation (ROSC) whilst preventing hypoxic brain injury.

**Methodology:** Using Medline 1947-2012 (OVID interface), the search strategy was as follows: {[CPR.mp. OR cardiopulmonary resuscitation.mp. OR internal cardiac massage.mp. OR chest compressions.mp.] AND [adrenaline.mp. OR epinephrine.mp.] AND [survival.mp. OR mortality.mp.]} LIMIT to [human]}. 242 papers were found, however, 236 were irrelevant or of insufficient quality for inclusion.

**Discussion:** Trials examining the efficacy of adrenaline following cardiac arrest are logistically, and ethically, challenging, however, data from both observational studies and randomised controlled trials (RCTs) suggest administration may be associated with reduced long-term survival. The evidence is strong for ROSC and survival to hospital admission, but associated with worse long-term survival and neurological outcome. Evidence from a retrospective analysis of an RCT examining 848 cardiac arrests demonstrated reduced survival at 1 year [12% vs. 6%, no adrenaline vs. adrenaline, OR 0.5, p=0.004], and more favourable neurological outcome in those not receiving adrenaline [11% vs. 5%, no adrenaline vs. adrenaline, OR 0.4, p=0.001].

**Conclusion:** The use of adrenaline during CPR appears contrary to the available evidence. Guidelines would be directed, and aided, by a well-designed, multicentre placebo-controlled RCT to determine the efficacy of adrenaline in CPR.

**Epilepsy Doses of Valproate Combined With the Anti-Helminthic, Niclosamide, Synergistically Kill Myeloma Cells: a Potent New Anti-Myeloma Drug Combination.**

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**Background:** Multiple myeloma (MM) is an incurable plasma cell neoplasm characterized by multiple relapses. Using drug redeployment strategies, we have shown that the addition of sodium valproate (anti-epileptic/histone deacetylase inhibitor (HDI)) which had no activity alone, to niclosamide (anti-helminthic which targets the mitochondrial respiratory chain) at clinically achievable concentrations potentially reduced viability of MM cell lines. The aim of this project was to understand the anti-myeloma mechanism of action of valproate and niclosamide (VaN).

**Methods:** Cellular oxidative stress levels and apoptosis were measured using flow cytometry. Activity/levels of antioxidant proteins were quantified using biochemical studies. Relative changes in the levels of acetylated proteins (acetylome) were measured by immunoprecipitation and mass spectrometry.

**Results:** Niclosamide induced mitochondrial superoxide production by MM cell lines; decreased cell viability and increased apoptosis, which were potentiated by valproate. Glutathione depletion in cells treated with VaN was observed. Antioxidant (N-acetylcysteine) partially rescued cells from niclosamide- /VaN-induced death. Activity of mitochondrial SOD2 was reduced in VaN-treated cells; whilst activity of cytosolic SODs1/3 remained unchanged. Preliminary acetylome analysis data demonstrated that VaN synergistically enhances histone acetylation.

**Conclusions:** We have identified a potent anti-MM drug combination of valproate and niclosamide. Our data indicates that VaN activity is mediated through induction of oxidative stress. Analysis of the acetylome indicates that valproate, at low non-toxic doses, can be used effectively as an HDI when combined with niclosamide. Importantly, the concentrations of both niclosamide and valproate used are safe and affordable which will accelerate progression of VaN therapy to phase I/II clinical trials.

### An Anatomical and Functional Classification of Aneurysmal Arteriovenous Fistulae in Tayside Haemodialysis Patients – a Pilot Study

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Haemodialysis (HD) via an autologous arteriovenous (AV) fistula is the most frequently used treatment for end-stage renal failure. Fistula dilation is a complication but there is no accepted definition of what constitutes an aneurysm. Our aims were to describe aneurysmal fistulae anatomically and functionally.

Sixty patients (60 fistulae) underwent Duplex ultrasound scanning to measure the diameter and *volume index* (volume divided by fistula length) of their fistula venous limb. Urea Reduction Ratio was recorded to assess HD function. No data was available to inform a power calculation.

*Maximum fistula diameter* and *volume index* correlated significantly with *time since creation* ( $P < 0.001$ ,  $r = 0.749$ ). There was no correlation between *maximum diameter* or *volume index* and HD function or risk of bleeding ( $P > 0.05$ ). The 75<sup>th</sup> percentile was at a *maximum diameter* of 2.0cm and a *volume index* of 130mm<sup>2</sup>. The 95<sup>th</sup> percentile was at a *maximum diameter* of 3.3cm and a *volume index* of 564mm<sup>2</sup>.

Apart from cosmetic issues, decreased HD function and bleeding issues are the main clinical concerns with aneurysmal fistulae. If the lack of correlation between these concerns and *maximum diameter* or *volume index* is confirmed in future work, the concept of an aneurysmal fistula must be challenged as a clinically relevant entity. Some studies define aneurysm as 2.0cm dilation (75<sup>th</sup> percentile); however our results suggest that a larger diameter such as 3.3cm (95<sup>th</sup> percentile) or accounting for symptoms related to dilation may be a more appropriate definition. These data will be used to inform a power calculation for future work.

### Phase III Trial for the Efficacy of VSL#3 in the treatment of IBS-Constipation and Slow Transit Constipation

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Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder, with no obvious structural or biochemical basis. The use of probiotics in IBS appears to be safe and beneficial. The aim of this study was to assess the efficacy of the probiotic VSL#3 in patients with IBS-Constipation (IBS-C) and slow transit constipation (STC).

This is a Phase III, open label, single-centre and single dose study. Patients aged between 18-60 years, with a diagnosis of IBS-C and STC were included. Patients received one sachet (4.4g) of open label VSL#3, twice a day, for 12 weeks. Patients completed a two-week stool diary recording bowel frequency and consistency, The Patient Assessment of Constipation Symptoms Questionnaire (PAC-SYM) and IBS Symptom Severity Scale (IBS-SSS), at baseline and at 12 weeks.

In total, seventy-two patients were studied (34 STC, 38 IBS-C). The mean age was 29 (age range 18-63), 61 (85%) were female, with a mean duration of symptoms of 10.3 years. There was a significant increase in both patient groups, in terms of mean weekly bowel frequency ( $p < 0.00001$ ) and mean stool consistency ( $p < 0.01$ ). IBS-C demonstrated a reduction in the average number of days without abdominal pain ( $p < 0.0001$ ), which was not found in STC.

VSL#3 improved stool frequency in both STC and IBS-C patients; it also improved pain in IBS-C patients. These data form the basis for a power calculation for a formal randomised study of VSL in STC and IBS-C.

### Insulin-like growth factors with cognition and dementia risk: the Caerphilly Prospective Study

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**Background:** The increasing incidence of cognitive impairment and dementia in an aging population poses a significant burden on healthcare and economic resources. Consequently, identifying modifiable physiological factors which may influence the onset of cognitive decline are becoming increasingly important. Previous studies have suggested an association between levels of insulin-like growth factors and cognitive function. We hypothesised that low IGF-I, IGF-II and IGF molar ratio would be associated with cognitive decline and risk of dementia.

**Methods:** We examined prospective associations between IGF-I, IGF-II and IGFBP-3 and cognitive function in the Caerphilly Prospective Study (CaPS) (n = 745 men) from samples obtained around 1986, with assessment in around 2003 for clinical diagnosis of cognitive impairment but no dementia (CIND) or dementia.

**Results:** IGF-II was associated with a reduced odds ratio for CIND (0.76, 95% CI 0.60, 0.96) which hardly altered after further adjustment for confounders. A one standard deviation increase in IGFBP-3 amongst participants without dementia or CIND was associated with greater decline in cognition (p=0.002) equivalent to 2.4 years difference in age. All the associations between IGF-I and our outcomes were consistent with chance.

**Conclusion:** We found that both IGF-II and IGFBP-3 may have a role in influencing both normal age-related cognitive decline as well as clinical pathology associated with CIND, but we failed to replicate previous associations with IGF-I. Assuming these findings are replicated, they may provide new insights into potential biological mechanisms that underlie age-related cognitive changes as well as pathophysiological pathways leading to dementia.

### Does undergraduate suture training make the cut? A national student survey

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**Background:** Suturing is a practical skill expected to be attained by all medical students on graduation, according to the General Medical Council's (GMC) Tomorrow's Doctors (2009).

There are no GMC recommendations for the minimal amount of undergraduate suture training or level of competence.

This study examines the state of undergraduate suture training by surveying a sample of medical students across the UK.

**Methods:** We produced an online survey, which was sent to five medical schools for distribution via secretarial bulletins after completion of undergraduate suture training.

This survey included questions relating to career intention, hours of curricular suture training, hours of additional paid training, confidence in performing various suture techniques and knowledge of their indications. We also asked about proficiency in injecting local anaesthetic and overall opinion of medical school suture training adequacy.

#### Results

In total, we received 332 responses from five medical schools after their scheduled curricular suture training.

283 (85.2%) reported completion of curricular suture training.

299 (90.1%) reported that they felt they did not have adequate suture training in medical school.

86 (25.9%) had paid for additional suture training.

**Conclusions:** Our study suggested that this area requires attention by the medical schools and clarification by the GMC. We recommend more opportunities for students to develop suture skills and specific recommendations for expected competency by the GMC.



**CD163 Scavenging of Extracellular Haemoglobin post Subarachnoid Haemorrhage**

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Subsequent to subarachnoid haemorrhage (SAH), extracellular haemoglobin is a fundamental constituent in the pathogenesis of delayed cerebral ischemia. This is the consequence of cerebral vasospasm. Systemically haemoglobin is metabolized by the CD163-haptoglobin scavenging system. This is the first study to investigate the scavenging system in human brains post SAH. Post-mortem brains of those that died after SAH (n=6) and those that died with no neurological pathology (n=5) were immunohistochemically stained against: CD163 (perivascular macrophage), CD68 (microglial lysozyme), ADAM 17 (CD163 inhibitor) and hypoxia inducible factors. Perls' staining was performed to assess the presence of haemoglobin. Anatomical division of the tissue into regions with and without blood provided internal controls. The meninges and grey matter underwent separate quantitative analysis using Image J. The CD163 system was significantly down-regulated in the meninges of the SAH cases in presence of blood (P=0.028). CD68 revealed a trend towards an increase in the meninges of the SAH cases with blood. Perls' staining demonstrated a trend for increased Hb scavenging in regions with blood although insignificant (P=0.169). ADAM 17 was found in both cases and controls, no difference was observed between levels in the meninges (p=0.908) or grey matter (P=0.911). Increased CD163 endocytosis was clearly demonstrated, although on its own it is insufficient. A therapeutic intervention is required to amplify this response. Future work should explore activity of other scavenging systems including CD91 to determine if there is any compensatory increase to remove haemoglobin

**Is disease progression related to CAG repeat length in Huntington's disease?**

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**Background:** Huntington's disease (HD) is classed as a trinucleotide repeat expansion disorder of the CAG codon. Previous research has found a link between CAG repeat length and the age of disease onset. However; the link between CAG length and the rate of disease progression is less clear. Functional assessment and independence scores have been found to be accurate markers of disease progression.

**Method:** Data was obtained from two sources. The preliminary method obtained relevant UHDRS scores, age of onset and CAG repeat length through patient notes. No ethical approval was required for this data mining. The second source of data was provided by the European HD Network with ethical approval. This contained the relevant information which had been previously extracted from 1,835 patients from 17 different countries.

**Results:** 86 patients matched the inclusion criteria in the data obtained from patient notes, 1,598 were included from the EHDN database. Analysis of the two datasets found that CAG length accounted for between 63% to 66% of variation in the age of onset. An analysis of the relationship between CAG length and disease progression was carried out whilst correcting for the effect of disease duration. In the patient note data, no correlation was found. An analysis of the EHDN data showed a highly significant (p<0.001) but weak negative correlation (-0.113).

**Discussion:** CAG repeat length is a strong indicator of age of onset and graphical representations of the findings may be used as a tool for estimating age of onset. This may be of benefit to some patients. The findings also show that there are other factors which affect age of onset. Further research is needed to investigate the effect of other genetic factors besides CAG repeat length.

### The role of the Eps8 binding partners Sos1 and Abi1 in Pancreatic Cancer

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Pancreatic cancer (PC) is characterised by marked local invasion, which requires actin cytoskeletal remodelling. EGF receptor pathway substrate 8 (Eps8) is an actin-binding protein with multiple binding partners including Sos1, Abi1, and certain  $\beta$  integrin subunits.  $\alpha\beta6$  integrin is overexpressed in approximately 70% of PC and enhances invasion. This study examines the role of Sos1 and Abi1 in  $\alpha\beta6$ -dependent PC invasion.

We used immunohistochemistry to examine expression of Eps8, Sos1 and Abi1 in normal pancreas and PC *in vivo*. A retrospective patient database was generated of those treated surgically for PC (2000-2008) and used to identify 39 short ( $\leq 2$  years) and 20 long ( $\geq 4$  years) survivors. Resection tissue was then stained for Eps8/Sos1/Abi1/ $\alpha\beta6$ . We identified three PC cell lines that showed  $\alpha\beta6$ -dependent motility *in vitro*, and performed Transwell® assays to study the functional roles of Sos1 and Abi1.

Eps8, Sos1 and Abi1 were upregulated in PC compared with normal tissue. Expression of these proteins in long and short survivors is currently being examined. Eps8, Sos1, Abi1 and  $\alpha\beta6$  expression was confirmed in all three PC cell lines tested. Knockdown of Eps8, Sos1 or Abi1 significantly suppressed  $\alpha\beta6$ -dependent migration and invasion.

Eps8, Sos1 and Abi1 are upregulated in PC and appear to be critical to  $\alpha\beta6$ -dependent PC motility. Interestingly, Sos1 expression was previously shown to fall in response to gemcitabine, the current gold standard chemotherapeutic agent for the treatment of PC. Sos1 therefore requires further investigation as a potential molecular target in the treatment of PC.

### Endovascular Repair of Ruptured Abdominal Aortic Aneurysms: A Real World View

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**Background:** The mortality rate following a ruptured abdominal aortic aneurysm (AAA) can be as high as 88%. Surgical repair is the only option. Endovascular Repair (EVAR) is considered to be superior compared to Open Repair (OR) for elective cases however its benefits in ruptured AAAs require further evidence. This study therefore aims to compare the two procedures and furthermore aims to investigate the effects of risk factors as outcome predictors post repair.

**Methods:** A retrospective study of a partially prospective database was carried out at Queen's Medical Centre. Patients who underwent either EVAR or OR for a ruptured AAA between the years of 2001 and 2010 were selected using an inclusion-exclusion criteria. The primary outcome of mortality (30 day and overall mortality) was investigated for EVAR and OR and the risk factors.

**Results:** 265 patients constituted the sample of this study (EVAR=113, OR=152). The 30 day ( $p=0.053$ ) mortality rate was 38.9% for EVAR and 40.8% for OR. Increasing age displayed a general increase in 30 day mortality for both EVAR ( $p=0.042$ ) and OR ( $p=0.043$ ). Presence of lung disease increased the risk of 30 day mortality by nearly 3 times ( $p=0.003$ ) and smoking history ( $p=0.01$ ) increased the risk of overall mortality.

**Conclusion:** EVAR did not show an advantage over OR and the 30 day mortality was comparable in both groups. Some risk factors as potential outcome predictors were identified, which may allow the surgical team to recognise high risk individuals and deal with them appropriately to reduce the risk of mortality.

**Upregulation of NF- $\kappa$ B by short cyld protects mice against *Listeria monocytogenes* infection via pro-inflammatory cytokines**

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The NF- $\kappa$ B pathway plays an essential role in the immune system by modulating the production of pro-inflammatory and anti-inflammatory mediators, so called cytokines. With our experiments we aimed to find out why an upregulation of the NF- $\kappa$ B pathway in innate immune cells leads to protection of mice against *Listeria monocytogenes* infection.

For our experiments we used knockout mice with an upregulation of NF- $\kappa$ B in dendritic cells, which are cells of the innate immune system. The enhanced activation is mediated by short cyld, a naturally occurring splice variant of the tumor suppressor gene cyld. Following *Listeria* infection we compared these mice to their wildtype littermates with regard to survival and bacterial loads in their spleens. In flow cytometry experiments we analysed cytokine production by dendritic cells and other leucocyte subsets. We verified the protective function of specific pro-inflammatory cytokines against *Listeria* infection by performing in vivo depletion experiments.

After infection knockout mice had prolonged survival rates as well as lower bacterial numbers in their spleens. Flow cytometry experiments revealed a higher production of the pro-inflammatory cytokines IL-12 by dendritic cells and IFN- $\gamma$  in T-cells of knockout mice.

Our research shows that enhanced activation of the NF- $\kappa$ B pathway in dendritic cells leads to protection against *Listeria* infection via elevated levels of IL-12, which in turn lead to higher production of IFN- $\gamma$  by T-cells. After depletion of IL-12 knockout mice lose their IL-12 and IFN- $\gamma$  mediated protection and become just as susceptible to *Listeria* infection as their wildtype littermates.

**Optimisation of PCR Primers for Semi-Quantitative PCR looking for Effects of Fatty Acids and Endocannabinoids on Redox Gene Expression**

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Omega-3 fatty acids and their endocannabinoid derivatives have been shown to have anti-cancer effects in breast and prostate cancer cells. It is also known that alteration of the expression of redox enzymes plays a role in formation of these cancers, and we aimed to determine whether redox enzyme gene expressions are affected by treatment with omega-3 fatty acids and their derivatives. The specific aim of this project was to optimize conditions for semi-quantitative RT-PCR to identify the effects on the expression of redox gene expression when treating cancer cells with omega-3 fatty acids and their endocannabinoid derivatives.

PCR primers for Thiredoxin Receptor (TRXR), Catalase 1 (CAT) and Glutathione Peroxidase 1 (GPX1) were optimized for semi-quantitative RT-PCR. This involved optimising the PCR conditions including temperature, Magnesium concentration and correct cycle numbers to detect differences in gene expression, using 18S internal control genes for standardization. Prostate cancer cell lines (PC3) were treated with omega-3 fatty acids and their endocannabinoid derivatives, and then RNA was extracted using Trizol. RNA was then converted to cDNA using Superscript II reverse transcriptase prior to being amplified by PCR. Densitometry was used to determine differences in gene expression.

Results have shown that TRXR1 and CAT, in particular are significantly reduced after treatment, more so, with the endocannabinoid derivatives.

In conclusion, treating the cancer cells with fatty acids and endocannabinoids reduces the expression of key redox genes, which may be a result of allowing oxidative damage to build up in the cancer cells and causing them to undergo apoptosis.



**Nutrient sensing in the human gut: Investigation of the co-localization rate between CaSR, T1R1 and GPR43 receptors with satiety peptides in the human antrum, terminal ileum and ascending colon**

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**Background:** Increasing evidence from animal studies show that apical nutrient sensing receptors, expressed in gut enteroendocrine cells, play a key role in the release of satiety peptides. Early human studies indicate a similar expression pattern of these receptors and role in peptide release. In this study the anatomical relationship between amino acid sensing (CaSR), carbohydrate sensing (T1R1), and short chain fatty acid sensing (GPR43) receptors and appetite regulating peptides GLP-1, PYY, 5-HT was investigated in the human gut.

**Methods:** Healthy full thickness human gut sections were incubated with primary and fluorescent secondary antibodies and they were viewed under the fluoroscopic microscope to investigate co-localization of the CaSR, T1R1 and GPR43 with the GLP1, PYY and 5HT.

**Results:** The co-localization rate between CaSR and PYY, GLP1 and 5HT was 0%, <1% and 43% in the antrum, 20%, 12% and 82% in the ileum and 26%, 14% and 91% in the colon, respectively. Co-localization of T1R1 and GLP1 was observed only in the antrum and the colon. GPR43 was not expressed.

**Conclusion:** The results suggest a CaSR mediated PYY, GLP1 and 5HT release in the human gut, which could be further expanded to the development of new anti-obesity strategies

**Cardiovascular, Renal and Metabolic Outcomes of Obese Living Kidney Donors**

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Increased demand for renal transplant has led to acceptance of marginal donors, such as individuals with obesity. Long-term safety of renal donation in this group has not been established. This study assessed renal, metabolic and cardiovascular outcomes following nephrectomy in obese living kidney donors.

A retrospective cohort study of living kidney donors undergoing nephrectomy at the UHW from 18<sup>th</sup> October 2004 and 18<sup>th</sup> October 2010. Donors were grouped according to BMI (at time of donation) as normal weight (NWD), overweight (OWD) or obese (OD), according to WHO categories. Outcomes were determined upto 2 years post donation. Donors who were followed up at other centres were excluded.

183 (n=121) donor nephrectomies were performed. The estimated glomerular filtration rate (eGFR) showed significant reduction from baseline at 2 years in all three BMI groups (NWD = -27.0%, OWD = -27.9%, OD = -31.7%) but no significant differences between groups. Systolic blood pressure and diastolic blood pressure were significantly higher at baseline ( $p = 0.015$ ,  $p = 0.01$ ) and at 1 year among OD than NWD ( $p = 0.047$ ,  $p = 0.006$ ), independent of confounders. There was no difference in blood glucose between all groups at baseline ( $p = 0.134$ ) or at 2 years ( $p = 0.432$ ).

Obesity is not associated with worse renal function in the medium term. Questions remain over the cardiovascular risk profile of obese donors, and whether or not donation increases this risk independently of the effects of obesity. Caution is still required when accepting obese individuals for donation.

**Using a microfluidic device to investigate the role of the furry gene in *Dictyostelium discoideum***

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**Background:** The Furry (FRY) gene is an evolutionary conserved gene that is present in yeast, *Drosophila*, amoeba and humans. In *Drosophila* the FRY gene has shown to have a role in maintaining polarized cell extensions and in the development of sensory neurons. Although the function of FRY in amoeba and humans still remains unknown, it is possible that it may have a similar role in amoeba as it does in *Drosophila*. The aim of this study was the investigation of *Dictyostelium discoideum*, and to find the potential role of the FRY gene in cell migration.

**Experimental design:** FRY was knocked out of wild type cells and rescued by reintroducing the FRY gene into the knockout strain. These strains were examined and compared against a wild type cell. A microfluidic device was used to provide a controlled environment for rapid single cell analysis of a cell migrating using a confocal microscope. The images retrieved specified the phenotype of the cell and were used to calculate cell velocity.

**Results:** FRY was not shown to affect the average cell velocity but a tail like phenotype extending from the back of the cell was produced in the FRY knockout strain.

**Conclusion:** These findings could localize the FRY gene at the back of the cell and suggest that FRY is involved in regulating the integrity of the rear cytoskeleton. The cell migration mechanics of amoeba are similar to human neutrophils and further research could elicit the role of FRY in human cells.

**A case-series evaluating the risk of distal DVTs: should we treat?**

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Deep vein thrombosis (DVT) most commonly occurs in the lower limb, and can lead to pulmonary embolism (PE). New NICE guidance recommends that all patients with high probability of DVT have proximal leg compression ultrasonography and D-dimer assay with repeat scan 1 week later in patients with negative scan but positive D-dimer. The Royal Cornwall Hospital (RCH) currently does full-leg scans and treats distal DVTs with 6 weeks warfarin.

This is a retrospective case-series of 348 patients diagnosed with DVTs via the RCH DVT-clinic during a 12-month period (up to 30 September 2012). Information was collected about patients re-presenting within 3 months of initial diagnosis to evaluate PE event-rate among these. Fisher exact test was used to analyse clinical significance of difference in PE rates between patients with proximal and distal DVTs. Statistical significance:  $p < 0.05$ .

In RCH, 36.8% of patients presenting to the DVT-clinic have distal DVTs. 0.9% of all patients in this study developed a PE within 3 months of initial presentation. While a higher proportion of patients with distal DVTs (2.3%) than proximal DVTs (0.5%) developed PEs this difference was not statistically significant ( $p = 0.14$ ).

If the new NICE guidelines are followed DVTs would be missed in a considerable portion of patients. This study found no significant difference in PE event-rates between patients with proximal and distal DVTs. However, since all patients were treated no conclusions can be drawn on this and further research is necessary to assess the true extension and PE-rate of distal DVTs in untreated patients.

### An audit of the NHS Lothian Early Rheumatoid Arthritis (ERA) Clinic: from a real life perspective

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**Background:** It is clear from a number of studies that early and aggressive treatment of rheumatoid arthritis leads to sustained clinical benefit [1,2,3,4]. However, this data has been acquired in the setting of clinical studies allowing intensive review of patients. In our ERA clinic, we introduced a new treatment protocol that included a 12-week course of high dose tapering prednisolone therapy. Patients were also commenced on methotrexate and a step up combination therapy over the subsequent 12 months according to any disease activity. They were reviewed every 2 months until discharged. We aimed to audit the clinical outcome of patients diagnosed with rheumatoid arthritis for <2 years referred to the ERA clinic in Lothian.

**Methods:** A retrospective audit of medical records was conducted on 130 patients, of which 30 were not suitable for inclusion. Primary outcome measures were mean fall in disease activity score, proportion of patients with a good response (following EULAR response criteria) and working status at 1 year after treatment.

**Results:** We noted a highly significant drop ( $p < 0.0001$ ) in mean DAS28 score at first 3 months (5.4 to 3.9) with an on-going gradual reduction for the subsequent 9 months. Mean DAS28 score at 12 months was 2.6 with 92.9% patients achieving low disease activity. There were no reported serious adverse events. 6% of patients gave up working after 12 months of treatment.

**Conclusion:** An ERA protocol that includes a short tapering course of high dose prednisolone results in a rapid and sustained reduction of disease activity with no excess morbidity.

### Development of a protocol for maximising the field of view of ultra-wide-field images in premature infants with retinopathy of prematurity

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**Background:** Ultra-wide-field (UWF) imaging enables visualisation of the posterior pole as well as the peripheral retinal vasculature. Our purpose was to develop a protocol that would maximise the field of view of UWF images obtained in premature infants with ROP.

**Method:** A schematic premature model eye was constructed containing a grid with 10-degree inclinations in multiple meridians engraved on its posterior surface. UWF images of the grid were obtained with the model eye held at a variable number of distances away from the device. The horizontal field of view (HFOV) and vertical field of view (VFOV) of the images were analysed. A 4mm and 7mm pupil diameter were used for each imaging distance. All images were acquired using the Optos Panoramic 200MA device. A protocol based on optimal imaging distance and necessity of pupil dilatation was then developed. The protocol was applied to a group of 30 premature infants with ROP.

**Results:** The maximal HFOV and VFOV of images were acquired at a distance of 2.5cm in front of the imaging device. The HFOV and VFOV were shown to be statistically higher when images were acquired through a 7mm pupil diameter in comparison to a 4mm pupil diameter ( $P$  value  $< 0.001$ ). A protocol of holding premature infants at 2.5cm in front of the imaging device with pupil dilatation was able to successfully acquire ultra-wide-field images with in 30 ROP infants.

**Conclusion:** A successful protocol was developed that enabled clinical application of ultra-wide-field imaging to premature infants with ROP.

**A study examining rates of medical staff recognition of pressure ulceration in hospital inpatients**

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*The Royal Bournemouth Hospital, Dorset, UK*

**Background:** The incidence of pressure ulceration among UK hospital inpatients has been estimated at 10.2–10.3%. These patients are at increased risk of developing osteomyelitis and subsequent sepsis. This study sought to test whether medical staff recognition rates of hospital inpatients with pressure ulceration were low and to consider underlying causes and potential solutions.

**Methods:** Interviews were conducted with nursing staff on multiple wards in July 2012 to obtain a definitive list of patients with pressure ulcers, with their corresponding location and grade. Junior members of medical teams with responsibility for the same group of patients were independently interviewed and asked to identify all patients who they knew to have pressure ulcers. The number correctly identified by the medical teams was compared with the total number of known pressure ulcers to produce a recognition rate. Patients with clinical evidence of sepsis were highlighted.

**Results:** Twenty-seven patients on five wards were identified by nursing staff as having pressure ulceration areas. Nine patients were stated to have multiple pressure ulceration areas, giving a total of 38 pressure ulcers. Medical teams correctly identified eight of 27 (29.6%) of these patients. The correct site and grade was identified in four of 38 (10.5%) and two of 38 (5.3%) cases, respectively. Of these patients 14/27 (51.8%) had evidence of infection. In this subgroup five of 14 (35.7%) were correctly identified as having pressure ulceration areas.

**Conclusions:** The lack of medical awareness could lead to delayed recognition of deep-seated infection or osteomyelitis. Reasons for this are likely to be multifactorial and require a combination of cultural change, improved education and improved information sharing.

**Are patients receiving neoadjuvant therapy for rectal cancer appropriately?**

Smith R  
*Newcastle University, Newcastle upon Tyne, UK*

**Background:** Preoperative chemo/radiotherapy has been a recent addition to the management of rectal cancer. The management decision in Northumbria Healthcare NHS Foundation Trust is made following a discussion at the MDT. With the introduction of specific guidelines by NICE in 2011 this has become an important area for a new audit to be undertaken.

**Aims:** To establish whether rectal cancer patients are receiving the correct preoperative treatment based on their MRI scans and elicit areas to improve care.

**Method:** Trust registration was obtained. Analyse MRI reports and neoadjuvant therapies of all 40 newly diagnosed rectal cancer patients in 2012 in the Northumbria Healthcare Trust. Correlate with the NICE guidance to establish compliance rate of management according to the notes.

**Results**

Outcome	Number	Compliance
Excluded from study	7	N/A
Missing MRI form	3	(9.1%)
Correctly Managed	22	66.7%
Incorrectly Managed	8	24.2%

**Conclusion:** Whilst the compliance rate was high, there were areas that can be improved.

1. MRI report forms should have NICE criteria laid out that have to be filled in.
2. When decisions about therapy contradict the guidelines, the reasoning has to be recorded in the notes.
3. Further education on guidelines and management in the trust.

Pooling data with the Low Rectal Cancer National Development Programme (LOREC), started in October 2012, will allow comparisons against the compliance rate of other centres outside Northumbria. It will be important to re-audit next year to establish the impact that this audit and LOREC have made.

### Permeability of poly (glycerol-adipate) nanoparticles across an *in vitro* model of the blood-brain barrier

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**Introduction:** The blood-brain barrier (BBB) exhibits selective permeability to regulate influx of molecules into intracranial regions. Most drugs are incapable of crossing the BBB and are rendered clinically ineffective due to their inability to reach their target site of action. Poly (glycerol-adipate) (PGA) nanoparticles (NPs) are versatile carriers, which can incorporate drugs within their structure to enable transport across the BBB, offering a novel solution to the problem of effective drug delivery into the brain.

**Methods:** This study investigated the permeability of polysorbate 80 coated PGA NPs tagged with the fluorescent marker Rhodamine B Isothiocyanate across an *in vitro*, three-compartment immortalised human brain endothelial cell (hCMEC/D3) monolayer model of the BBB after 1, 2 and 4 hours.

To establish the selective permeability of the model, 4, 40 and 70 kDa Dextran was used.

**Results:** Relative to unseeded controls (no barrier), flow of Dextran between compartments was cumulatively reduced 57%, 56% and 32% (4, 40 and 70 kDa respectively) across time periods investigated, attesting the barrier's functional efficacy. No such difference in permeability was observed for PGA NPs, with a reduction of only 2%, 13% and 6% at 1, 2 and 4 hours respectively post administration.

**Discussion:** This pilot study demonstrated the ability of PGA NPs to cross the BBB *in vitro* and advances the possibility of their future clinical use in treating neurological disorders. Further experiments are warranted to extend this study.

'I would like to acknowledge and thank Dr Terry Parker, my supervisor, for his support & assistance & Delyan Ivanov for the provision of nanoparticles'

### Maternal high fat diet during pregnancy and lactation alters mitochondrial electron transport chain activity and gene expression in adult mouse offspring heart

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Obesogenic diets during pregnancy increase cardiovascular disease susceptibility in the offspring later in life. The mitochondria are involved in the pathogenesis and development of various types of heart disease. We examined mitochondrial electron transport chain activity and expression of genes with key roles in mitochondrial metabolism in heart tissues of offspring from obese mothers fed a high fat (HF) diet. Female mice were fed either a HF diet or standard chow diet 4-6 weeks prior to and during gestation and lactation. Weaned offspring were fed the HF or C diet, generating the dam-offspring groups: C/C, C/HF, HF/C, HF/HF. The left ventricle of offspring was processed for mitochondrial Complex I and II enzyme activity and for qPCR of the mitochondrial *Sirt3*, *UCP2*, *UCP3*, *ANT1*, *ANT2*, *PGC1α* and *NRF1*. Complex I and II activity was reduced by 1.5 fold ( $p < 0.001$ ) in the HF/HF. *Sirt3* mRNA level was 2.6-fold lower ( $p < 0.01$ ) in offspring hearts from HF-fed dams (HF/C and HF/HF groups). *UCP2* and *UCP3* mRNA levels were 2.3 and 4-fold higher (both at  $p < 0.0001$ ), in HF/HF. *ANT1* and *ANT2* transcript levels were reduced by more than 1.3-fold ( $p < 0.01$ ) in HF/HF. *PGC1α* mRNA levels were 1.4-fold lower ( $p < 0.01$ ) while *NRF1* mRNA levels were 3-fold higher ( $p < 0.0001$ ) in HF/HF. The results suggest maternal high fat diet during pregnancy and lactation alters mitochondrial ETC activities and expression of genes involved in mitochondrial function and biogenesis. This priming effect in early life increases offspring risk to cardiac pathologies in later life.



**Maternal Vitamin D Deficiency in Tower Hamlets PCT**

Khan A\*; Finer S; Beski S; MacCallum P  
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**Background:** A wealth of data highlights the high prevalence of vitamin D deficiency in the UK, and association with adverse health outcomes. National guidance supports vitamin D supplementation during pregnancy. Our locally deprived and ethnically-diverse population has a high burden of adverse pregnancy outcomes. We sought to identify prevalence of vitamin D deficiency, with which to develop an evidence base to guide effective local policy and reduce adverse pregnancy outcomes.

**Method:** We performed vitamin D (25(OH) D) screening in an unbiased group of 500 women prior to the availability of supplements at their antenatal booking.

**Results:** Of 500 women screened (means: age 26, BMI 29; 60.34% Asian/Asian-British). Serum 25 (OH) D data was positively skewed with significant variation in concentrations between October and January. 85.72% of the whole sample were vitamin D insufficient (<75 nmol/L) and 74.45% deficient (<50nmol/L), the ethnic group most affected were the Asian/Asian-British (median serum 25 (OH) D 28.00 nmol/L (IQR: 14-40.75), 81.45% had severe deficiency). Significant variation was found between ethnic group serum 25(OH)D concentrations. 16 week GTT showed a significant inverse relationship between log 25 (OH) D and fasting blood glucose levels ( $P < 0.001$ ,  $r^2 = 0.26$ , slope =  $-2.097 \pm 0.469$ , 95% CI: 1.156- 3.038). No significant difference was found in 25 (OH)D between GDM and no GDM groups.

**Conclusion:** We have identified prevalent vitamin D deficiency in all ethnicities in our local pregnant population, which has warranted the introduction of guidelines and supplementation at a population level rather than at a risk group level.

**Effect of Maternal Protein Diet On Neural Stem Cells In The E14.5 Mouse Embryo**

Smith P\*; Fleming T; Willaime-Morawek S  
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A maternal low protein diet (LPD) has shown to have negative effects on the development of the fetal brain leading to structural and behavioural abnormalities. We aimed to investigate the mechanisms behind this and hypothesised that a maternal LPD would have a negative effect on neurogenesis in the fetal brain.

We took the brains of E14.5 mouse embryos from mothers fed different diets during gestation, and isolated the fetal neural stem cells (NSC). We looked at three different diets; a low protein diet, a low protein switch diet (LPSD; LPD until 3.5 days of gestation, control diet after) and a control diet. We implemented neurosphere culture and immunocytochemistry techniques to compare the effect of diet on the properties of the NSCs.

Our data indicates a significant decrease in primary neurosphere formation with the LPD compared to the control and LPSD and this is maintained into the second generation with the smaller but not the larger sized primary neurospheres. Immunocytochemistry showed an increase in the number of NSCs present and no change in the amount of proliferation and differentiation in the LPD group compared to the control. Interestingly in the LPSD group we found an increase in differentiation and a decrease in proliferation and NSC number suggesting an inability to compensate and maintain normal development.

Overall our work is beginning to reveal a profound effect of the maternal protein diet on neurogenesis in the fetus and is also indicating the importance of the timing and duration of the restriction.

### *Clinical Audit and Service Evaluation Category*

#### **Daycase TURP: An Initial Experience**

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**Introduction:** Transurethral resection of the prostate (TURP) is an inpatient procedure in the UK. There are several countries where it has been routinely performed as a daycase procedure. Furthermore, it is included in the NHS best practice tariffs, and has now been introduced on appropriate patients in our department.

**Methods:** Patients included had prostates 60g or less, no social issues, and the ability to look after a catheter. Patients were placed on finasteride, tranexamic acid used intraoperatively for larger resections, and short acting prilocaine spinal anaesthesia used.

Prospective data on the first 20 patients was collected. Information on demographics, indication for surgery, preoperative IPSS, inpatient stay, pathology and functional outcomes were obtained.

**Results:** The mean age was 67 years. 18 patients went home on the same day, 2 admitted overnight; one for anaesthetic reason, one for social reasons. Mean size of resection was 16.3g. There were no complications and no re-admissions. The mean improvement in IPSS score and bother score were 19 and 4 respectively.

**Conclusion:** Daycase TURP is a safe and effective procedure associated with a low complication rate and low re-admission rate. It should be considered in all patients undergoing TURP and extended to other appropriate endoscopic procedures

#### **Traditional versus modern wound dressings in the care of lower limb arthroplasty patients – do they make a difference?**

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**Background:** Wound care is an important part of lower limb arthroplasty. Blistering can lead to infection, increased postoperative pain, poor mobilisation and subsequently delayed discharge.

We audited current wound care following lower limb arthroplasty, introduced modern dressings, and re-evaluated using a prospective, comparative audit.

**Methods:** Two prospective audits were performed over a 6-month period. The initial audit included the traditional wound dressings of Opsite (Smith & Nephew Ltd.) and Mepore (Mölnycke Ltd.) Re-audit involved implementation of the modern dressing Aquacel (Convatec Ltd.).

Clinical success was determined by the wear time, number of in-patient dressing changes and blister rates. Statistical analysis using analysis of variances (ANOVA) with post hoc tests and two-tailed unpaired t-tests were performed when appropriate.

**Summary of results:** Seventy patients underwent lower limb arthroplasty with either total hip (n=41) or total knee (n=29) replacement. The initial audit included forty patients with traditional dressings (Mepore n=18, Opsite, n=22). Implementation of the modern dressing (Aquacel) included thirty patients. The modern dressing required fewer dressing changes during the in-patient stay (1.3) compared with the traditional dressings (2.3)  $p < 0.001$ . The mean wear time was significantly greater with the modern dressing (4.2 days), versus traditional dressings (2.3 days)  $p < 0.001$ . Blister rates were non-existent with the modern dressing and fifteen percent (n=6) with the traditional dressings.

**Conclusion:** Traditional wound dressings are associated with earlier, more frequent dressing changes in the post-operative period and blister formation.

Modern dressings (Aquacel) significantly enhance the care of lower limb arthroplasty patients

**Gynaecological history (GH) and  $\beta$ -hCG: Do surgeons accurately and routinely document this information?**

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*Perth Royal Infirmary, NHS Tayside, UK*

**Background:** Any female patient of reproductive age (FPORA) admitted to an acute surgical receiving unit (ASRU) must be fully assessed and surgical emergencies excluded. It was felt that the ASRU at Perth Royal Infirmary (PRI) failed to accurately document a complete GH and results of  $\beta$ -hCG for some FPORA. This project aimed to quantify this observation and propose changes in practice if required.

**Method:** A proforma was designed to collect a range of patient information specific to FPORA. Data was collected retrospectively from 80 FPORA who presented to ASRU at PRI. The results were presented at a surgical departmental meeting. Aims to improve documentation of GH and  $\beta$ -hCG were proposed using a prompt in the clerk-in. Second cycle of audit was carried out: final changes to practice are awaited.

**Results:** First audit: 50 FPORA medical records were evaluated. The initial assessment showed: 30% had GH and 26% had  $\beta$ -hCG test results documented. A prompt was added to the clerk-in document, then a second audit of 30 FPORA medical records were evaluated. Assessment of the clerk-in documents showed: 86% had GH and 72%  $\beta$ -hCG results documented.

**Conclusion:** Our initial audit demonstrates that documentation of GH and  $\beta$ -hCG results in FPORA at ASRU in PRI is often incomplete. Through amending the admission clerk-in document we have achieved a significant improvement in the accurate documentation of this information. We propose to implement a permanent amendment to the clerk-in document in order to facilitate the management of our FPORA.

**Are junior doctors best prepared to prescribe insulin?**

Sukcharoen K\*; Everson M; Smith C  
*Great Western Hospital, Swindon, UK*

**Background:** Maladministration of insulin has been identified as a never-event by the Department of Health. A recent National Diabetes Inpatient audit has identified significant errors resulting from insulin prescribing. Drug charts are usually started by junior doctors when patients are first admitted into hospital. A recent Foundation Year 1 (F1) induction survey showed that after induction week, F1s still did not feel confident in prescribing insulin.

**Aims and Objectives:** Errors in insulin prescribing have resulted in harm to patients at Great Western Hospital. Last quarter, four reported cases of prescribing error, one of which caused harm to a patient. The aim of this audit is to identify common errors in prescribing, using standards set by the National Patient Safety Agency and Department of Health.

**Methods:** The audit examined the prescription charts of 40 insulin-dependant diabetic patients who were admitted between July and November 2011.

**Results:** As maladministration of insulin is a never-event. The standards set in this audit is 100%. This audit identified comparatively more insulin prescribing errors at GWH compared to another trust, in which the same audit was performed, which has an insulin prescribing section in its drug charts.

Most notable difference is the 'units written in full' where GWH achieved 75% compared to 92% in a trust where 'units' has already been provided. Not writing 'units' in full poses a risk of the prescription being misread and many trusts have reported patients receiving the wrong dose of insulin.

**Key Findings:** The audit suggests that lack of knowledge and understanding of the importance of insulin prescribing amongst junior doctors may be one of the contributing factors for error. After presenting findings to the pharmacy and medical grand round, recommendations for change include:

- Adding an insulin prescribing section into the drug chart.
- Emphasis on junior doctor education by bringing forward the F1 insulin prescribing teaching into F1 induction week.
- Improve junior doctors knowledge by making e-learning module on diabetes compulsory

Produce a credit card sized information card on different types of insulin and how they work for easy access extra information

### A Multi-Department Audit Evaluating Dose Adjustment in Renal Impairment for Patients at the Extremes of Age

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**Background:** The British National Formulary (BNF) recommends dose adjustment in renal impairment ( $\text{GFR}[\text{MDRD}] < 60 \text{ ml/min/1.73m}^2$ ) to prevent toxicity, reduced drug efficacy and other adverse events<sup>1,2,3</sup>. A 2010 geriatrics audit found an 87.6% compliance rate. Its adjoining survey highlighted poor confidence in foundation doctors in identifying the necessary drugs<sup>4</sup>. A re-audit was undertaken and compared with paediatrics (where compliance was unknown).

#### Objectives

- a) To assess prescribing compliance with the commonest-used resource
- b) To explore the potential for an educational/ reference tool to improve prescribing accuracy

**Methods:** Part I - Data for 20 geriatric inpatients (Ward 15) and 20 renal paediatric outpatients (GNCH) were collected using online and paper records. Active prescriptions were compared with the respective BNFs and pre-admission prescriptions. Part II - a multiple-choice questionnaire was issued to doctors prescribing on Ward 15 and for paediatric renal patients.

**Results:** Of the total 343 prescriptions, 331 (96.5%) complied: 226/234 (96.6%) in geriatrics and 105/109 (96.3%) in paediatrics. 10 (83.3%) non-compliant prescriptions were present pre-admission. 6 (35.3%) of 17 non-compliant pre-admission prescriptions were suspended. The survey ( $n=15$ ) found again poor confidence in newly-qualified doctors. Regarding the most useful suggestion for improvement, 40% selected more training, 40% access to renal-specific guidelines and 20% prescribing reminders.

**Conclusion:** Both departments had non-compliant prescriptions at harmful doses. However, the improvement in compliance and non-recurring pattern of non-compliant drugs makes systematic error unlikely. Foundation doctors remain poorly confident for which improved training before qualification is recommended plus ward-access to The-Renal-Drug-Handbook. A re-audit including clinical reasons for non-compliance would address limitations

### A Quality and Safety Improvement with Lasting Benefits

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The timely completion of discharge summaries (DSs) provides essential information to facilitate patients' effective and safe transition from secondary to primary care [GMC, 2009].

We conducted a standards-based audit of the completion of DSs for the general surgery department at Tameside General Hospital. Areas identified as needing improvement included; the management and tracking of case notes, the availability of adequate computers facilities, the understanding about the responsibility and acceptable time-frame for completing DSs and the handover of those responsibilities at the start of each FY1/FY2 rotation. After making these changes, a re-audit showed significant improvements and identified further action points that have since been implemented and will be assessed in the next audit cycle.

Our initial audit showed that only 34% of DSs were completed within 7 days, and 38% of discharged patients had no DS. Following the system changes this improved to 69% and 19% respectively. The improvement in the 24 hour target from 23% to 27% was modest in comparison.

The system changes improved the timely completion of DSs but more work is needed to meet the CQUIN target of 95% of DSs within 24 hours. A major challenge of this project was how to continue improving the system through repeated audit cycles after the FY1 audit-lead had left the department. This was achieved by creating a new surgical FY1 role to complete one audit cycle during each 4 month rotation. We encourage other doctors to use a similar approach in order to maintain their quality improvements.

**Use of TASC II Classification to Assess Accuracy of Lower Limb Duplex Ultrasonography**

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*The Pennine Acute Hospital NHS Trust, Greater Manchester, UK*

**Background:** Discrepancy of lower limbs angiographic findings with pre-operative duplex ultrasonography results is not uncommonly seen. This study evaluated the validity rates of lower limbs duplex ultrasonography in patients with peripheral vascular disease.

**Method:** This is a retrospective and consecutive study over a three-month period (Oct 2012 – Dec 2012) in the radiology department in a general district hospital. We audited 82 patients who attended for angioplasty within the study period. We compared both pre-operative duplex reports and angiographic images by using the Trans Atlantic Inter-Society Consensus (TASC II) classification. The time intervals between the examinations were noted. The result of the lower limb duplex ultrasonography was considered accurate if the lesion's TASC II classification grade was consistent with the angiogram findings.

**Results:** Overall, 89% of our lower limbs duplex ultrasonography reports matched with the angiographic findings. However, duplex exam performed within 3 months of the angiogram had an accuracy rate of 93%, compared to 81% with those performed more than 3 months prior to the angiogram.

**Conclusion:** Lower limb duplex ultrasonography provided accurate information for radiologists to plan for angioplasty. However, we recommended that the needs of angioplasty should be assessed, and procedure performed within 3 months of their lower limb duplex examinations.

**Chest X-Ray Review and Documentation – A Re-Audit**

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**Background:** It is a clinical governance issue that doctors should chase the results of investigations they arrange, and act upon them, if needed.

Mostly, junior doctors admit patients on acute medical wards and A&E. It is vital for patient safety, good clinical care, and medico-legal reasons that results of investigations are documented in medical notes and important findings are not missed.

Initially, an audit of 'Documentation of Chest X-ray reviews' was conducted in 2010. It showed 66% of Chest X-ray results were documented by doctors. Subsequently, standardized clerk-in and ward round sheets with a pre-printed section for radiology results' documentation were introduced.

This re-audit assessed the effectiveness of actions implemented after the first audit, hence closing the loop.

**Method:** Retrospective review of case notes of 50 in-patients' on Gastroenterology ward, over a period of 8 weeks in 2012. We used PACS to look up radiology images and reports. A data collection proforma was used, followed by input into MS Excel for analysis.

**Results:** Improved compliance with standards was seen, 78% of Chest X-ray reviews were documented, mostly within 24 hours of the test. A decrease in formal reporting of images noted.

**Conclusions:** Junior doctors should be encouraged to chase results and handover pending investigations. Difficult images should be discussed with radiology. More departments to use standardized ward round and hand over sheets. To introduce the 'File' option on radiology software in our trust- a time saver during busy on-calls and proof that results have been noted.



### Quality improvement in medical notes

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Medical records form an important backbone of continuation of patient care across health services and over time. The importance of accurate and legible documentation is of ever growing importance with increased litigation and staff rotation.

We assessed 30 sets of notes within the Leeds General Infirmary to quantify existing practice. This allowed us to establish areas for improvement before making an intervention and reassessing.

Using trust approved guidelines for medical records we found that entries were consistently illegible (66%), only 30% had an identifiable author with fewer having their contact details and only 10% with a date and time. In order to address the broad range of issues we developed bookmarks that highlighted areas needing improvement and were attached in medical notes at the current admission.

Reassessing the medical records after an interval of four weeks showed a dramatic improvement in the quality of record keeping. The number of illegible notes decreased by 24% and over 95% of entries were signed, with 45% having an identifiable author and contact details. Additionally feedback from team members was incredibly positive with many saying they felt an improvement in accessibility of the records due to increased ease of finding relevant sections in medical notes.

In conclusion implementation of the bookmark is a popular way to drastically improve the quality of note taking. With more time and a larger study a more significant impact may be seen warranting implementation of the bookmark in common practice.

### Emergency Management of Pelvic Fractures: An audit of practice before and after MTC status

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**Introduction:** Since April 2012 major trauma in the UK has been consolidated to larger units designated as Major Trauma Centres (MTC). Pelvic fractures are indicative of high energy injury carrying a significant risk of morbidity and mortality. All suspected pelvic fractures should be diverted to an MTC with the expectation of improving clinical identification and treatment of these patients.

Pelvic binders have been demonstrated to effectively stabilize these injuries – reducing pain, limiting intra-pelvic volume and reducing haemorrhage. This facilitates safe transfer and aids in resuscitation. Their use is recommended for all suspected pelvic injuries.

**Methods:** We audited binder use in the six months before and after MTC status at the Royal Victoria Infirmary, Newcastle-Upon-Tyne. The standards applied were that: all subsequently proven pelvic fractures should be identified as clinically suspect pre-hospital or in resus; all suspected pelvic fractures should have a binder applied; binders should be placed correctly (at the level of the greater trochanter); binders should be visible on initial radiology.

**Results:** The number of pelvic fractures admitted post-MTC increased from 16 to 34. Binder application rates were below the standard and did not improve (38% vs. 41% ( $p=1$ )). When binders were used, they were mostly correctly positioned, (80% vs 92% ( $p=0.47$ )).

**Conclusions:** The rate of pelvic binder application has remained consistently low, and below our ideal standard of care. The expectation that increasing numbers at a single specialist unit would improve clinical identification and management has not been realised. A programme of education and re-audit is being implemented.

**Lung Cancer Pathway Audit (Routine Two Week Rule vs Fast Track)**

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**Background:** Patients with suspected lung cancer (LC) are referred to St Helier's Hospital (SHH) via the Two Week Rule pathway (TWRP). They are seen within 14 days of receiving TWR referral; investigations conducted within 28 days, treatment started within 62 days of referral. We found much inefficiency with TWRP and decided to pilot a LC Fast Track pathway (FTP). Our aim was to compare the TWRP to the FTP.

**Methods:** Information regarding referral time, date of diagnosis, treatments were gathered for all patients referred to LC clinic via the TWRP and FTP between May - July 2011. We used the SHH, Royal Marsden's Hospital database, analysed it in Microsoft Excel Software. Questionnaires were sent out to all patients.

**Results:** Of the 42 patients, 9 were referred via FTP and 33 via TWRP. The following averages were calculated, referral to histological diagnosis: FTP 12.6 days, TWRP 27.6 days, referral to MDT discussion: FTP 15.6 days, TWRP 33.3 days, referral to treatment: FTP 15.6 days, TWRP 54.9 days. 66% patients received their first treatment prior to breach date. 92% of patients were satisfied with the services received.

**Conclusions:** We found that there was a significant reduction in time to diagnosis and referral to treatment with FTP. There were no negative comments from patients taking part in the FTP. The numbers were too small to measure mortality. The audit period included the early period when there were a few logistical problems. We plan to continue piloting the FTP and to re-audit in 2013.

**Antimicrobial stewardship in the fight against resistance – an audit of antimicrobial prescribing practices for surgical prophylaxis**

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The recent report by England's chief medical officer is set to put antimicrobial resistance in the international spotlight. With very few antibiotics in development, our arsenal against increasingly resistant bacteria is diminishing, raising concerns about a bleak future where untreatable infections are rife. As such, there has been a call for antimicrobial resistance to be put on the UK national risk register and for the issue to take an international stage at this year's G8 summit and by the WHO. Prudent antibiotic prophylaxis aims to reduce the incidence of surgical site infection whilst minimising collateral effects, including development of resistant bacteria. This audit examined the peri-operative prescribing practices at Royal Hampshire County Hospital, UK. Over a specified period, data was collected regarding choice, dose, timing and duration of prophylactic antibiotics administered to patients undergoing surgery. Data collected was compared to best practice as determined by the Trust's antimicrobial guidelines. Initial findings revealed only 70% of cases complied with the guidelines, precipitating surgical-microbiological collaboration and revision of the guidelines. With a focused effort on education and awareness, and installation of laminated and highlighted copies of the guidelines in all anaesthetic rooms, successive audit cycles have shown increasing improvement. The latest audit cycle reveals that 91% of cases received appropriate prophylactic antibiotics, 89% of which were fully compliant with hospital guidelines. We conclude that simple measures can greatly impact compliance with best practice. It is this kind of *local* antimicrobial stewardship that will be vital in the global fight against antimicrobial resistance.

**An Audit of the Management of Infected Venous Leg Ulcers**

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**Background:** Venous ulcers are a significant public health issue, and infection can lead to slower healing. Currently, different aspects of management are covered by several different general ulcer management guidelines. This audit evaluated the local management of patients with infected ulcers, using standards compiled from different national guidelines against which to audit. It aimed to assess the need for specific guidance on the management of infected ulcers.

**Methods:** All patients who had a venous ulcer swabbed at Beccles Medical Practice between April and October 2011 were audited (n=50). The reason for the swab, the timing of antibiotic treatment and the treatment given were recorded in a spreadsheet using information from patient notes. Data was analysed by the calculation of percentages and confidence intervals.

**Results:** The majority of swabs (88%, 95% CI 79-97%) were being taken for clinically suspected infection, as recommended by national guidance. Just 25% (95%CI 12-37%) of patients were being started on empirical antibiotics, and only 50% of these were given antibiotics recommended by national guidance. 11 patients (25%, 95%CI 12-37%) were not prescribed antibiotics at all despite clinically evident infection.

**Conclusions:** In this study, most swabs of venous ulcers were being taken appropriately, but antibiotics were being started later than recommended, and non-recommended treatment was often used. Some patients were not treated despite infection. Infected ulcers are easily treatable, and this can prevent increased morbidity. Clear and easily accessible guidelines should therefore be introduced to ensure appropriate management of infections.

**Emergency Theatre Audit - Adherence to NCEPOD national guidelines and assessing theatre utilisation**

Davies E\*; Lewis C; Hall C

*Royal Albert Edward Infirmary, Wigan, UK*

**Background:** Delays in patients getting timely access to theatre are detrimental to patient outcomes. Patients with septic shock if delayed >12 hours their mortality increases from 25% to >60% <sup>(1)</sup>. Overrunning elective work, workforce shortages and waiting for imaging contribute to delays. This audit aimed to establish if we were adhering to NCEPOD target 'time to theatre' guidelines and maximising theatre utilisation.

**Methods:** Data was collated from NCEPOD emergency lists and the theatre computer database. Data collected included; booking times, entry into theatre times, NCEPOD classification, patient details and operation performed. We compared the elapsed time between booking and theatre entry to NCEPOD 'target time' over 12 weeks.

**Results:** 84 days of emergency lists were included however 8 lists were untraceable. Traceable lists involved 288 patients. Average no. of cases per week 25.9. 63% (n=182 cases) complied with NCEPOD 'time to theatre' guidelines, in 30% (n=86 cases) there was inadequate data, 7% (n=21 cases) were delayed and did not comply with guidelines. The theatre was underutilised in the evening (5PM – 9PM) only 13% of cases (n=31) performed compared to 17% (n=41) out of hours (OOH - 9PM-9AM).

**Conclusions:** Unclear from evidence collected the causation of delays. Possibilities include theatre staff reallocated to overrunning elective lists, delays in imaging, 8pm handover contributing to underutilisation of evening slot. Recommended redesign of sheet, consultants to classify operations according to NCEPOD grade, include theatre staff in 'trauma style' handover, change shift patterns to include consultant led ward round 3pm and thus utilise evening theatre space and minimise operating OOH

(1) ASGBI – Emergency general surgery guidelines: May 2012

**Perineal Repair Documentation & Support – Improving Standards for Women**

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Perineal damage during labour can result in morbidity for women and litigation for hospitals. Clinical Negligence Scheme for Trusts (CNST) Maternity Risk Management Standards requires that maternity services demonstrate compliance with documentation for perineal trauma including consent for perineal repair and discussion of support following perineal trauma.

We conducted a prospective audit of antenatal and postnatal case notes for women having vaginal deliveries over a one month period. We assessed for perineal trauma, documentation of consent for repair and provision of support. Following initial results we recommended raising staff awareness of documentation. A checklist covering support after 3<sup>rd</sup> and 4<sup>th</sup> degree tears was also introduced. We re-audited after 15 months to assess effectiveness of these measures.

Initial audit of 75 vaginal deliveries found only 8 (23%) of 52 women offered perineal repair had documentation of consent. No women had documentation of provision of support following perineal trauma. Repeat audit of 76 vaginal deliveries with 49 perineal repairs found 15 (43%) had documentation of consent and 5 (12%) had documentation of support.

Interventions at our centre to date to improve documentation around perineal trauma have shown a modest improvement. However, further measures are required to reach 75% compliance for CNST level 2, and to improve support for women and decrease litigation. We recommend further staff education, redesign of the labour notes to incorporate consent and discussion of support and introduction of a patient information leaflet on perineal trauma. This is underway and we will re-audit 6 months from implementation.

**Clinical audit on the management of acute upper gastrointestinal bleed in East Kent Health Trust (EKHT)**

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**Background:** This audit was conducted to evaluate trust performance (East Kent Health Trust – EKHT) in accordance to NICE guidelines on the management of acute upper gastrointestinal bleed (AUGIB).

NICE guidelines for AUGIB:

1. Blatchford score calculated at presentation and Full Rockall score post endoscopy. Blatchford score of 0 means patient can be discharged with outpatient endoscopy. Rockall score predicts risk of mortality and rebleeding from AUGIB.
2. Non-variceal bleeding should not be treated with adrenaline monotherapy – higher risk of rebleeding. Endotherapies combined with adrenaline (mechanical clips, thermal coagulation or fibrin/thrombin) recommended.
3. Patients with variceal bleeding should be given terlipressin and prophylactic antibiotics – reduces mortality.

**Method:** We included 47 patients, who presented to EKHT with signs of AUGIB, covering six months period from 1<sup>st</sup> July 2012. Data was gathered using hospital notes, endoscopy reports and hospital discharge letters.

**Results:** Use of Blatchford Score and Rockall score in AUGIB in EKHT was 0% and 20% respectively.

53% of non-variceal bleeds were treated with adrenaline monotherapy.

All variceal bleeds were managed with terlipressin, 80% received prophylactic antibiotics.

**Conclusion:** Use of scoring systems in EKHT for AUGIB was poor. Non-variceal bleeding management not following NICE guidelines. Not all patients with variceal bleeding received both terlipressin and prophylactic antibiotics.

Implementation of change from the audit – Pocket scoring system guides have been produced for doctors in the trust to use.

Audit was presented at local gastrointestinal departmental meeting and hospital grand round to highlight changes needed to meet NICE guidelines.

Plan: Re-audit in six month to evaluate effects of changes

**Documentation of Early Warning Scores (EWS) in an Old Age Psychiatry Inpatient Setting: an Audit**

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In the setting of inpatient old-age psychiatry, the risk of acute physical deterioration given patients' age, comorbidities and reduced physiological reserve is noteworthy. Recent clinical incidents highlighted late recognition of physical ill-health within this population. We assessed the use of the EWS in an old-age psychiatry hospital.

A retrospective audit of physical observation charts was performed on 28 patients across two wards between 10<sup>th</sup> – 16<sup>th</sup> September 2012. Standards were developed from Trust guidance. Microsoft Excel was used for data analysis.

A minimum of 196 observations were expected (7x28), but in total 232 observations were recorded.

1. Physical observations monitored at least once daily.

143/196 (73.0%)

2. Minimum observations documented: heart rate, respiratory rate, blood pressure, conscious level and temperature.

0/232 (0%)

Complete set of observations never documented. Blood pressure was recorded on 97.4% occasions, heart rate 96.6%, temperature 51.7%, respiratory rate 6.9% and conscious level 0.9%.

3. EWS calculated with each set of physical observations

0/232 (0%)

4. 'Time Driven Action Plan' followed if EWS  $\geq 2$

0/232 (0%)

5. If no physical observations recorded, reason why documented

28/53 (52.8%)

Our audit highlights that recording of basic observations and use of EWS is inadequate in this setting. This may lead to delay in identification of acute physical deterioration and thus increase morbidity and mortality.

Recommendations included: 1) Present data to junior and senior medical and nursing staff; 2) Raise awareness of the importance of EWS through posters and education sessions; 3) Review trust policy regarding physical observations; 4) Re-audit Spring 2013.

**Urinary Catheterisation Audit**

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Trust guidance requires every catheterisation to be documented in medical notes and catheter care charts. Patient safety is maintained by noting all catheterisation attempts and reducing associated complications. Infection is a risk, especially MRSA, where catheterisation is the top cause.

Our aim was to check whether our practice was compliant. To our knowledge, no such audit has been conducted.

Four areas at the Friarage Hospital catheterise frequently: Allerton (surgical ward), post-operative surgical day unit, Accident&Emergency, and theatres. The original audit was in July. The re-audit was between August and September. Patient notes were perused to check for chart use, correct completion and an entry inserted in the medical notes.

Our objective was to achieve 100% compliance throughout. For the first audit, 30% of the cohort used the chart, 23% documented verbal consent gained, and 60% documented catheterisation in medical notes. For the re-audit, 90% used the chart, 53% documented verbal consent, and 43% documented catheterisation in medical notes.

During the implementation period between audits, awareness was raised of trust guidelines regarding the catheter care chart, its availability was checked, colleagues were encouraged to document and their input considered. Issues raised were poorly completed form sections, consent not obtained in theatre, and double documentation. Our recommendations included changing the form, and educating staff as to correct documentation.

Documentation improved since the first audit. Together with the Patient Safety team, we modified the chart. We are raising awareness about this important issue and will re-audit after the new chart is available.



**Phyllodes tumour versus fibroadenoma: Differentiation by ultrasound and core biopsy features**

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*Leeds Teaching Hospitals, West Yorkshire, UK*

Phyllodes tumour is a rare fibroepithelial neoplasm with an unpredictable nature, requiring complete surgical excision. Clinical, radiological and pathological findings are similar to fibroadenoma, presenting a diagnostic challenge. Often women with fibroadenoma are over-treated with complete surgical excision because the possibility of phyllodes tumour cannot be ruled out. The purpose was to determine whether sonographic or histopathological core biopsy findings allow discrimination before diagnostic excision.

69 women with breast lesions defined as B3 by core biopsy were retrospectively evaluated from 2008-2012, including 49 fibroadenomas and 20 phyllodes tumours on final histology. Comparison of pre-operative sonographic and core biopsy findings was made for each group.

49/69 (71%) cases classified as B3 "cannot exclude phyllodes tumour" at core biopsy were confirmed fibroadenomas on final histology at complete excision. A lesion was statistically significantly more likely to be a fibroadenoma if it was well-defined on ultrasound and more likely to be phyllodes if internal vascularity was present. At core biopsy, evidence of nuclear atypia, sub-epithelial or peri-ductal condensation, epithelial hyperplasia, irregular or ill-defined margins and a biphasic lesion were statistically significantly more likely to be phyllodes tumours. No other differentiating sonographic or core biopsy findings were found to be statistically significant.

The above features hold statistical significance to distinguish between the two diagnoses pre-operatively. However, due to considerable overlap, many of these features were present pre-operatively for the fibroadenoma group and subsequently lead to surgical excision. The findings presented might not change the number of patients requiring complete excision.

**An audit to identify the current use of a formal risk assessment tool within the North Crisis Resolution and Home Treatment Team, Cardiff**

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In psychiatry, appropriate use of risk assessment tools (e.g. the CPA-4) is core to holistic management of mental health service users (MHSU). This audit proposed to examine current use of the CPA-4 (examining static and dynamic risk factors) in managing MHSU under the care of the North Crisis Resolution and Home Treatment Team (NCRHTT). A literature review was conducted, including national and local risk assessment guidelines.

Audit standard: 100% MHSU having recorded CPA-4's completed according to Welsh Assembly Government guidelines (on admission, discharge and at any significant event during admission).

Cohort: the most recent 50 MHSU admitted (> 5 days) and discharged between 10/08/2012–10/11/2012 under the NCRHTT.

An audit tool retrospectively assessing CPA-4 use was piloted and revised. Complete datasets were then collected for the full cohort (n=50), via PARIS, made anonymous, and analysed using SPSS v20.0.

49 MHSU (98%) had admission CPA-4's. However, only 14% underwent CPA-4 reassessment, and 0% had >1 CPA-4 reassessment, regardless of admission duration (mean 18.7(5-60) days), until discharge. 88% had discharge CPA-4's.

On further analysis, quality of CPA-4 completion was poor with 6-30% CPA-4's incomplete; historical and current risk factors, and future management were the most frequently erroneous areas.

Audit standards were not met. Improvements could be implemented by raising guideline awareness and altering PARIS software to ensure CPA-4 completion. However, there should be recognition that complex form filling does not equal good risk management. Clinical practice and results should be recognised when assessing quality of care

### Pre-admission Analgesia and Altered Mental State in Neck of Femur Fracture Patients

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**Background:** Neck of femur fracture patients mostly belong to the elderly population, a group with increased sensitivity to opiates as well as significant incidence of cognitive impairment.

**Aim:** To assess whether pre-admission opiate analgesia affects the mental state as examined by the mental state questionnaire (MSQ).

**Methodology:** Data was collected prospectively and included individual's age, type and amount of analgesia received before ward admission, presence of confounding factors such as dementia and intercurrent infection, admission MSQ and discharge MSQ.

**Results:** The average age of the patient population was 79.8years (range 58 to 97). 33% had known cognitive impairment. The mean dose of morphine received before ward arrival was 8.7mg (range 2.5mg to 20mg). Two patients did not receive any opiate analgesia. The difference between admission MSQ and discharge MSQ was found to be that of one point or less in 85% (n = 23) of patients. None of the patients were found to have had a significantly lower MSQ on admission then at discharge.

**Conclusion:** Opiate analgesia does not significantly alter mental state as measured by the MSQ. This is an important negative finding which should encourage health care professionals involved in the initial management of neck of femur fractures to deliver opiate analgesia as necessary to control pain in this common and distressing type of injury

### A Case-Series: South East Wales Lower Limb Amputations For Trauma –How Many Walk With Prosthesis In A 2.5 Year Period, and How Many Co-morbidities Do They Have?

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**Background:** Many consider the majority of patients following lower limb amputation never walk. This retrospective study looked at all South East Wales's patients who underwent lower limb amputation due to trauma, between 01/01/2010 and the 31/8/2012 who were referred to The Artificial Limbs and Appliance Centre.

**Method:** Over 500 patients were assessed during this time period by a rehabilitation team in South East Wales to assess suitability for prosthetic rehab, 300 patients were suitable for prosthetic rehab. 26 patients met the original criteria, of the 26 patients 1 was excluded due to early mortality. The level of amputation was assessed, as well as if the patient was a unilateral or bilateral amputee. Risk factors (including 34 co-morbidity variables) were collected.

**Results:** Of the 25 patients 20(80%) mobilised with a prosthesis, of the 5(20%) not mobilising with a prosthesis 1(4%) transfers from bed to chair with a prosthesis. All amputations performed were unilateral, with 19(76%) transtibial and 6(24%) transfemoral. The mobilisation rate across transtibial and transfemoral were 16(84.2%) and 4(66.7%) respectively.

Of 34 co-morbidity variables collected it was found that only 19 were present. The most common co-morbidities were: hypertension 9(36%), Osteoarthritis 5(20%), Diabetes 4(16%), and atrial fibrillation 3(12%). On average each patient had 1.6 co-morbidities.

**Conclusion:** Unsurprisingly unilateral transtibial mobilisation rates 19(84.2%) were higher than those of unilateral transfemoral mobilisation rates 4(66.7%). While this was expected, more data is needed to validate this case series. Furthermore it is shown that trauma patients have very few co-morbidities (average 1.6 per patient).

### The Safety of Administration and Prescription of Oral Purgatives Prior to Elective Colonoscopy

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**Aim:** In 2009 the NPSA produced a rapid response report highlighting the potential for harm due to the inappropriate administration of oral purgatives. Subsequently, the consensus guidelines by Connor *et al* outlined recommendations for the safe use of such agents. This study compared practice in a small district general hospital to the guidelines to identify areas for improvement.

**Methods:** A prospective study of 40 patients who underwent elective colonoscopy between October and December 2012 was performed using information from the notes and direct questioning.

**Results:** No patients with absolute or relative contraindications received purgatives. All patients received Picolax at an appropriate dose and were given instructions on oral fluid intake. However, provision of information regarding patients' regular medication was poor with only 22% of patients being given adequate counselling. Of patients taking nephrotoxic medications, 8% were given specific information regarding their omission.

**Conclusions:** Poor medication advice resulted in regular medications being unnecessarily omitted and others being taken in too close association with purgatives for proper absorption. Deterioration in renal function can occur with the continuation of nephrotoxic drugs in the presence of purgative-related dehydration. Implementation of an updated patient information leaflet, education of endoscopy staff and re-audit are underway.

### Changing Attitudes in Enhanced Recovery Protocol Applied to Radical Cystectomy

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Radical cystectomy is commonly associated with greater mortality and inpatient stay than other urologic surgeries. The current study aims to determine the impact of an enhanced recovery protocol (ERP) on length of stay (LOS) and surgical outcome in patients undergoing radical cystectomy at our institution.

A retrospective study of patients undergoing elective radical cystectomy between October 2008 and March 2013 was performed. Data were extracted using case-notes and electronic databases. Patients receiving ERP were compared with those receiving non-ERP care; the ERP group was further subdivided into patients prior to August 2012 (old-ERP group) and those after (new-ERP group) to look for recent improvements. Statistical comparisons included age, BMI, length of stay, ASA score, complications, and mortality.

Out of the preliminary 96 consecutive patients, 45 received non-ERP care and 51 patients received ERP care (30 in old-ERP group, 21 in new-ERP group). Median LOS in the ERP group was 10.0d (IQR 7.0 to 17.0), vs. 14.0d (12.0 to 17.0) in the non-ERP group ( $p<0.01$ ). Within in the ERP group, the old-ERP group had a median LOS of 10.0d (8.0-17.3), vs. 7.0d (4.0 to 14.5) in the new-ERP group ( $p<0.05$ ). There were no statistically significant differences in complication rates or 90d mortality rates between any of the groups. The cohorts were also similar in demographic background and disease staging/grading.

ERP in radical cystectomy reduced the length of hospital stay without any observed adverse effects on mortality rate or post-operative complications. Renewed efforts in greater patient education even further reduced patient stay.

### Improving the Planning for Escalation of Care for Patients commencing Non-invasive Ventilation – a completed audit cycle

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**Background:** Patients who require non-invasive ventilation (NIV) for hypercapnic respiratory failure are critically ill and decisions regarding escalation to invasive ventilation must be made at an early stage. Communication with patients, families and carers is essential for good quality care in these patients, some of whom are in the last stages of life. We aimed to assess the quality of these aspects of care in patients initiating NIV.

**Methods:** We assessed case notes of consecutive patients starting NIV against selected British Thoracic Society recommendations, including:

- A management plan in the event of NIV failure should be made on initiation.
- Decisions regarding escalation of care should be discussed with the patient, family or carers
- Decisions must be made by ST3 doctors or higher

Following this audit, an NIV care document was developed. It included guidance on initiating and monitoring NIV. This was coupled with informal teaching of staff. A re-audit was then carried out.

**Results:** 16 patients were included in the initial audit and 17 in the re-audit. There was a significant increase in the proportion of patients with plans made (31% vs 94%,  $p < 0.01$ ). Evidence of discussions with patients or relatives improved (19% vs 59%,  $p = 0.02$ ). All decisions made in both audits were taken by doctors of grade ST3 or higher.

**Conclusion:** This completed audit cycle demonstrated that the introduction of an NIV care document in combination with informal education significantly improved management plans for patients starting on NIV. It also improved documentation of discussions with patients, families and carers

### Category 1 Caesarean section audit: comparing time to delivery and outcomes when regional or general anaesthesia is used

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**Background:** In Category 1 Caesarean section (Cat1CS), the life of mother or foetus is at immediate risk and prompt delivery is required (target  $< 30$ min).[1] Less than 15% of emergency sections should be performed under GA due to higher complication rates.[2][3] We audited our Cat1CS to establish indications for surgery, our GA rate, decision to delivery interval (DDI), and reasons for delays. We investigated relationships between anaesthetic modality, DDI, and outcomes (neonatal/ maternal).

**Methods:** Review of theatre records and obstetric notes of 48 Cat1CS (chosen at random) performed in 2012 (34% Cat1CS).

#### Results:

Most Cat1CS performed for pathological CTG (60.4%).

- 38% Cat1CS under GA (target  $< 15\%$ ).
- DDI statistically significantly longer with RA than GA (28.8 vs 24.5mins. Mann Whitney: $P = 0.03$ ).
- 71% Cat1CS performed  $\leq 30$ mins (target 75%).
- Documentation regarding delays was limited. Delays in the RA group appear to have occurred between anaesthesia and delivery (possibly due to induction time). Delays in the GA group occurred decision and anaesthesia, suggesting slow theatre transfer.
- No difference in outcomes between RA and GA groups including when DDI  $> 30$ mins. (Fishers: $P = 0.38$ ).

**Conclusions:** Our GA Cat1CS rate was above target but in line with national rates.[2] Better documentation is required regarding delays. We are working to reduce transfer to theatre times. We will extend the audit to give greater power to findings and investigate instances when DDI  $> 30$ mins to identify causes of delays.

**VTE risk assessment: are we meeting the standard?**

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**Background:** During my FY1 rotation in General Surgery, I witnessed a patient develop a pulmonary embolus eight days post-Hartmann's procedure.

The patient had been prescribed an inappropriately low dose of Enoxaparin on admission and continued to receive this throughout their admission.

I decided to audit the rate of venous thrombo-embolic (VTE) risk assessment completion in our admissions to help avoid similar adverse incidents.

**Methods:** Snapshot data collection involving 30 surgical inpatients (elective and emergency) with review of kardex/inpatient notes to determine if a formal VTE risk-assessment had been performed and documented.

I compared our rate of risk-assessment with the standard expected in the NICE guidelines and subsequently presented my findings at Audit. I also implemented a 'tick-box' on each patient's ward-round file to confirm they had been risk-assessed.

I then performed a re-audit five months later using the same method to close the audit loop.

**Results:** NICE guidelines suggest: 100% of patients should be appropriately VTE risk-assessed

Original audit, Jan 2012:

30% completion rate

Re-audit, June 2012:

68% completion rate

**Conclusion:** The delivery of my audit findings and implementation of recommended changes improved rates of VTE risk-assessment by 38% on the General Surgical ward.

Whilst there was a vast improvement this still falls below the recommended target outlined in the NICE guidelines.

Ongoing study into why our rate is falling below the National Standard is taking place.

**Pulmonary Embolism Audit**

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**Background:** Current National guidelines state that for suspicion of a Pulmonary Embolism (PE), risk should be quantitatively assessed using the Wells score. A value  $>4$  (suggesting high clinical suspicion) warrants a Computerised Tomography Pulmonary Angiogram (CTPA), whereas  $\leq 4$  (low risk/clinical suspicion) a D-dimer blood test is first line management.

**Methods:** A database was collated of all the CTPAs at the QEQM Hospital from the 1<sup>st</sup> of May to the 31<sup>st</sup> of July 2012. For each patient the CTPA outcome, any applicable D-dimer values and a retrospectively calculated Wells score from the radiology request form were recorded.

**Results and Discussion:** Out of the 302 CTPAs performed, a Wells score was documented in only 5 requests. 86.8% (262/302) of scans were negative, of these 7.3% (22/302) had a negative D-dimer and hence should not have been done. 13.2% (40/302) had no d-dimer with a Wells score  $\leq 4$ , where the scan should not have been first line.

**Conclusion:** Adherence to the national clinical pathway for PEs was poor, particularly with reference to the use of scoring systems, documented in 1.7% (5/302) of cases. This is where intervention could ameliorate practice and save resources.

**Plan:** To incorporate a compulsory Wells score box as part of the radiology request form. In conjunction, a pocket Wells score guide has been made accessible to the trust. The audit will be repeated within 6 months to evaluate the effects of the changes

### Acute Upper GI Bleeding – improving documentation and encouraging safer use of blood products

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**Background:** Acute upper gastrointestinal bleeding (AUGIB) is a common reason for emergency admission. National guidelines state that all patients with suspected AUGIB should be properly assessed and risk scored.

The transfusion of blood products conveys the risk of adverse events for patients. In addition evidence suggests that over-transfusion in AUGIB can be detrimental as it reduces the hypercoagulable state.

**Methods:** We carried out a retrospective audit of patients who had a diagnosis with AUGIB analysing whether they were risk scored and managed appropriately, and the number of blood products cross matched and given to patients.

**Results:** A total of 35 patients' notes were audited. Only 14% had a pre-endoscopy Rockall Score recorded. Of those patients who had a pre-endoscopy Rockall Score of 0, only 1 (33%) was considered for early discharge.

A total of 22 patients (62%) received a blood transfusion, and of those, half of them were over-transfused.

**Conclusion:** Our audit shows that we are currently not meeting any of the national guidelines with regards to assessment and risk -scoring of patients presenting with AUGIB.

In addition, there is the excessive cross-matching of blood putting patients at risk of potential life threatening complications.

In order to improve our documentation and assessment of patients presenting with AUGIB, we have designed a proforma, which should be used to clerk all patients with suspected AUGIB. We have also provided recommendations on when patients should be cross-matched and how many units they should be transfused

### Evaluating the impact of a regular consultant ward round

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**Background:** Regular consultant ward rounds have been shown to reduce patient length of stay and improve discharge planning (1). Balancing the competing demands of outpatient activity and inpatient oncology care has been difficult in our hospital. Previously there was no timetabled inpatient oncology consultant ward. Inpatients were managed by oncology specialist trainees, with ad-hoc review by their named consultant. A regular weekly consultant ward round was introduced.

**Materials and Methods:** To evaluate this, a retrospective case note analysis was undertaken. This included all patients admitted under oncology for the two months preceding and succeeding the new ward round. A staff survey also took place. Statistical analysis used Mann-Whitney U or Chi-Squared tests.

**Results:** 85 patient episodes met the inclusion criteria. Case notes were available for 63 episodes (74%). The average length of stay significantly decreased from 11 days to 3.5 days ( $p < 0.05$ ). The time to discharge after first consultant review also significantly decreased from 6 days to 2 days ( $p < 0.05$ ). The number of consultant reviews and time to first consultant review remained unchanged ( $p =$  not significant). The percentage of patients receiving a consultant review increased, from 54.3 to 71.4%, though this was not statistically significant. However it is likely such a large increase is clinically significant. Staff satisfaction also improved following the new ward round.

**Conclusion:** This study suggests that a regular consultant ward round improves length of stay for patients, possibly through more patients having a consultant review and by expediting treatment and discharge decisions after such a review.



*Clinical and Patient-Related Work Category***A Novel Surgical Technique to Prevent Further Development of Potentially Catastrophic Blister Aneurysms**

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**Background:** Blister aneurysms of the internal carotid artery (ICA) are rare but potentially can cause catastrophic subarachnoid haemorrhages. They are often a neurosurgical dilemma as they are very difficult to treat and identify on imaging other than 3D digital subtraction angiography. Attempts to use traditional methods of coiling or clipping are often unsuccessful due to aneurismal detachment or rupture. These specific aneurysms expand relatively rapidly, lack a surgical neck and are thin walled, unlike common berry/ saccular aneurysms.

**Discussion:** The current literature consists of case reports or series describing suspected aetiology and poor outcomes after clipping or coiling. To date, only one study examines the effect of wrapping ruptured blister aneurysms with polytetrafluoroethylene (PTFE) patches. We describe the case of a 55 year old female, whom was identified as high risk of developing aneurysms due to a strong family history. We present a successful technique in which an enhanced carotid patch is wrapped and secured by sigeta clip around a non-ruptured supra-clinoidal internal carotid aneurysm and discuss its potential importance in preventing the development and rupture of blister aneurysms. Post-operative follow up demonstrated good patient recovery with intact neurology and no aneurismal remnant on computed tomography angiography.

**Case Conclusion:** In conclusion, we suggest that a wrap-clipping technique could be used both for prophylaxis and treatment of ruptured blister aneurysms, which could be superior to other traditional neurosurgical methods

**Vernix caseosa peritonitis: An enigmatic diagnosis presenting as right upper quadrant (RUQ) pain in post-partum period**

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**Background:** Vernix caseosa peritonitis (VCP) is a rarely documented condition, with just 23 cases reported. VCP results from amniotic fluid spillage into the peritoneal cavity during caesarean section, causing severe aseptic inflammation. The condition presents with abdominal pain, fever and leucocytosis. Diagnosis is often difficult and is invariably achieved by peritoneal biopsy. This case study reports a case of VCP occurring in Scotland and reviews this case in relation to other cases of VCP reported in the literature.

**Discussion:** A 26 year old woman presented ten days after caesarean section (LSCS) with severe RUQ pain and signs of sepsis. The diagnosis proved elusive but eventually was achieved by laparotomy and biopsy. The macroscopic appearance was of caseous white nodules which microscopically was rich in anucleate squamous cells. Literature review of the previous 23 reported cases reveals that foci of VCP in Morison's pouch and presentation with RUQ pain is common, diagnosis is frequently elusive, requiring multiple invasive investigations. Prevention by thorough lavage of the peritoneal cavity follows caesarean section, which focusses on dependent areas. VCP indicates the importance of lavage of the cavities, namely Morison's pouch.

**Conclusions:** VCP is a rare complication of LSCS and requires inadvertent opening of the peritoneal cavity. It involves aseptic immune response to intra-peritoneal vernix. The diagnosis should be suspected in women presenting soon after LSCS with RUQ pain and fever.

### First reported case of a Gastrointestinal stromal tumour concomitant with a Brenner tumour

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**Background:** Gastrointestinal stromal tumours (GISTs) as well as Brenner tumours are considered a rare malignancy. This is the first reported case in which a GIST tumour was diagnosed concomitantly with a Brenner tumour.

**Objectives:** To report a case of an undescribed association of Gastrointestinal tumour and Brenner tumour and to discuss its management.

**Design:** Case study and literature review.

**Patient and Methods:** A 64 year old woman with early satiety of 3 months duration underwent a CT scan, endoscopy and an ultrasound guided puncture which indicated a lesion suggestive of a GIST.

A videolaparoscopic partial gastrectomy was performed. During the surgery, a nodule of about 4cm in diameter in her right ovary was noted and a right oophorectomy was executed.

The gastric lesion of 2.5 cm in diameter was confirmed by immune-histochemistry as being a GIST with low malignancy risk and the ovarian lesion as a benign Brenner tumour.

Patient progressed uneventfully and was free of evidence of progressive disease in a two months post-operative follow-up.

A literature review of GIST and Brenner tumor cases was performed on Pubmed and SciELO-Scientific Eletronic Library On Line using the expressions "GIST", "Brenner tumor" and "Transitional cell tumor".

**Discussion/Conclusions:** This is the first documented case in which a GIST is found concomitantly with a Brenner tumour. The incidental finding of this ovarian tumour during the gastrectomy, emphasizes the importance of a meticulous abdominal exploration even when no metastasis of GIST are expected.

### Pamidronate as a treatment for post traumatic AVN of femoral head

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**Background:** Avascular necrosis (AVN) of the femoral head occurs when there is vascular compromise to the femoral head resulting in ischaemia to the bone. It is a recognised complication of posterior hip dislocation both in adults and children.

**Case:** A 14-year-old male patient presented with knee and hip pain after a quad bike accident. MRI revealed a fracture dislocation of the right hip with a small femoral head fragment. The patient underwent an open reduction but at 5 months post operation, he continued to have a limp and a repeat MRI showed early signs of AVN of the femoral head. Patient was started on pamidronate which controlled the progression of the disease.

**Discussion:** Various surgical options have been advocated for the treatment of AVN in young adults and children, including core decompression with or without bone graft. Bisphosphonate (alendronate) was first reported in 2001 to be an effective treatment for AVN of the femoral head as it retarded the progression of AVN, reduced the rate of collapse and led to improvement of symptoms. Evidence suggests that there is favourable outcome for early treatment of AVN using either surgical (decompression) or medical management. In young adults, medical management is preferred to avoid breaching of the growth plate.

**Conclusion:** This is the first reported case of post traumatic AVN in a young adult treated with pamidronate showing favourable early results

**Spontaneous surgical emphysema of the larynx following hyperextension of the neck**

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**Background:** A 39 year old with no ENT history presented to the ENT department complaining of hoarseness of the voice, odynophagia and the sensation of something flapping in his throat. The symptoms started following hyperextension of his neck to drink a cup of coffee. He reported hearing and feeling an audible crack over the thyroid cartilage followed by a coughing episode. On arrival he had palpable crepitus of his thyroid cartilage but no palpable surgical crepitus. Nasendoscopy revealed oedema of the arytenoid cartilage and bruising in the pyriform fossa and CT revealed moderate subcutaneous emphysema of the larynx although no fracture was seen. After conservative management with antibiotics, intravenous steroid and voice rest the patient made a complete recovery.

**Discussion:** Surgical emphysema of the larynx is rare in the absence of trauma and there are a paucity of case reports that describe such conditions. The few cases published in absence of trauma all relate to massive laryngeal tears in patients with compromised mucosal integrity due to disease or medication. We present what we believe to be an unusual, atraumatic mechanism for mucosal breach of the larynx with subsequent surgical emphysema, in absence of predisposing risk factors.

**Conclusion:** This represents an usual presentation of surgical emphysema of the larynx in the absence of trauma which resolved with conservative management. We encourage others to consider potentially significant laryngeal crepitus in patients presenting with seemingly benign laryngeal injury and to seriously assess the need for definitive anatomical imaging with a CT scan

**Bilateral Acanthamoeba keratitis: A case report**

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Acanthamoeba keratitis is a rare, acute sight-threatening infection of the cornea occurring mainly in regular contact lens-wearers. It is caused by Acanthamoeba, a free-living amoeba ubiquitously found in the environment, including fresh and sea water, soil, sewage, air and even medical equipment. The symptoms are often nonspecific, with redness, tearing, disproportional excruciating pain and photophobia being the commonest complaints. Unilateral involvement is the case in most reports in the literature, however, the much rarer bilateral infection is not unheard of. We report a case of a 17-year old female who is a regular contact lens wearer diagnosed with bilateral Acanthamoeba keratitis confirmed on corneal scrapings. Her vision never recovered completely and is now at imminent danger of going blind. Solutions for cleaning contact lens wear are not legally-bound to be tested against Acanthamoeba and to have this amended is one of the main recommendations that emerges from this report. The solution used by our patient contained neither isopropyl alcohol nor 3% hydrogen peroxide – two ingredients proved to be very effective disinfectants for soft lenses. Another factor is that very little information is given to patients when purchasing contact lenses including the advice not to wear lenses while in contact with water of any kind. The patient claims to have swam while wearing the lenses, three days prior admission and this is thought to be an important causative factor. Avoiding any water contact with the lenses/cases and ensuring the use of proper disinfecting solutions should allow adequate protection against this condition.

### A Pink Herring – A Case of Adult Onset Still's Disease

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**Background:** Adult onset Still's Disease (AOSD) is a rare form of inflammatory arthritis. The prevalence of this disease is 1.5 cases per 100,000-1,000,000. It is characterised by arthralgia, myalgia, pyrexia, a 'salmon-coloured' rash and lymphadenopathy. Diagnosis is clinical and the criteria suggested by Yamaguchi et al is the most sensitive at 96%. We describe a unique case that met the majority of these criteria, however in this case the classical rash was in fact a 'Pink-Herring'.

**Discussion:** A 47-year-old lady of Pakistani descent, was admitted with symptoms and signs suggestive of sepsis. Three months prior, she had been to Pakistan and remembered a mosquito bite during her stay. She complained of intermittent fever, myalgia, arthralgia and rash for a week and a sore throat for two days. On examination, she had tenderness in the neck with cervical lymphadenopathy and a macular salmon pink rash on the face, arms, upper back and legs.

Numerous infection screens were performed which all returned negative and she continued to spike temperatures of up to 41.5C even with antibiotic therapy.

Rheumatology opinion was sought and AOSD was considered as the possible diagnosis. Prednisolone was commenced; subsequently inflammatory markers began to subside with resolution of pyrexia. A skin biopsy showed lichenoid infiltrate with morphological features more compatible with a fixed drug eruption.

**Case Summary:** This highlights that the salmon pink rash was a coincidental finding in this case of AOSD, more related to a drug reaction even though the other symptoms were diagnostic of this disease.

### A Case of Recurrent Thrombosis and Adrenal Insufficiency

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Antiphospholipid syndrome (APS) is an acquired prothrombotic autoimmune disorder that may present with arterial or venous thrombosis in any organ or tissue. Testing for APS is recommended in patients under the age of 50 presenting with stroke, those with unprovoked DVT or PE, and those with specific pregnancy morbidity. Over 50% of patients with APS have a further thromboembolic event within 5-6 years of initial presentation. The optimal treatment strategy remains controversial but longterm anticoagulation is usually advised.

In the case reported, a 47 year old female presented with femoral artery embolism and developed acute adrenal failure during admission. High resolution MRI showed evidence of bilateral adrenal infiltration but was not diagnostic of adrenal infarction or haemorrhage. Three years following initial presentation, the patient represented with a right frontoparietal lobe infarction and developed a deep vein thrombosis. Investigations were persistently positive for lupus anticoagulant and anti-cardiolipin antibodies and a diagnosis of antiphospholipid syndrome was made.

Adrenal thrombosis is a recognised although rare feature of APS. This case highlights the necessity for suspicion of APS in young female patients presenting with thromboembolism of any vessel in the absence of thrombotic risk factors. Acute adrenal insufficiency with concurrent thromboses should guide the clinician to investigate APS as the underlying cause.

**Case Report: An unusual presentation of IgG4 disease in the neck***Quinn B**Daisy Hill Hospital, Newry, UK*

**Background:** IgG4 tubulointerstitial nephritis (IgG4-TIN) is the most common form of IgG4 renal disease. Renal pathology may be accompanied by other systemic manifestations, in which case the disease is known as IgG4 related systemic disease (IgG4-RSD). There are no published case reports of IgG4-RSD presenting as a submandibular mass, as in this case report.

**Discussion:** A 54 year old male presented to his General Practitioner with a painless lump in the right anterior triangle of the neck. An ultrasound-guided fine needle aspiration was performed. This found lymphoid infiltrate of both B- and T- lymphocytes with prominent populations of plasma cells and was consistent with the diagnosis of chronic sclerosing sialadenitis (Kuttner's tumour.) Upon routine follow up, two years later, haematological tests indicated deterioration in renal function. A renal biopsy was performed, which found extensive fibrocartilaginous fibrosis and abundant B-cells, T-cells and plasma IgG4 cells, confirming IgG4 disease. The condition responded to prolonged steroid treatment.

**Conclusion:** A case of IgG4-RSD is described, which presented as a submandibular neck lump with local lymphadenopathy. The disease eventually progressed to tubulointerstitial nephritis approximately two years later, which was confirmed on renal biopsy. While IgG4 disease can present in a number of different ways, this case report highlights an unusual presentation – a submandibular mass. It is important to reach a definitive diagnosis for a swelling in the neck and to be aware of the multisystem presentation of IgG4 disease

**A review of the effectiveness of a specialised tinnitus clinic in South Yorkshire***Xu Y**Sheffield Teaching Hospitals/Royal Hallamshire Hospital, Sheffield, UK*

**Background:** Tinnitus affects 10-15% of the general population and up to one in every three elderly. With the shift in demographics, UK's ageing population raises the problem that tinnitus will increase economic and healthcare burden. Due to the many aspects of tinnitus, a wide variation in clinical management is present and no guidelines have been published. We therefore propose that highly specialised tinnitus clinics will decrease the healthcare burden and streamline patient care.

**Method:** From 2008 to 2012, a prospective collection of data from N=452 patients who presented with tinnitus in a weekly specialised clinic was done. Every patient had hearing tests, a complete medical history taken and a full otoneurological examination. Education and reassurance about tinnitus and its innocuous nature were given, while self-help techniques were taught. Appropriate referrals to audiometry and psychology were made and all patients were booked for an imaging scan to rule out any pathology.

**Results:** 20% of patients were discharged after their initial consultation, while another 46% of patients were discharged by the second consultation. Only 11% needed more than three consultations. Results of imaging scans were informed via post and non-pathological patients were discharged back to primary care. The most common accompanying symptom was hearing loss (86%) and the most common precipitating factor was ear instrumentation (26%).

**Conclusion:** With a discharge rate of almost 70% by second consultation, we find that having specialised tinnitus clinics in district general hospitals is an efficient way of managing tinnitus in secondary care and should be encouraged

### Thiamine deficiency presenting as an acute, disabling, polyneuropathy – A rare presentation causing a considerable diagnostic challenge

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**Background:** Thiamine deficiency is an uncommon condition, which usually presents in the context of alcoholism with a Wernicke-Korsakoff type picture. This case highlights an atypical presentation with rapid onset polyneuropathy.

**Case:** A 67 year old lady presented to the gastroenterology clinic with a 2 month history of severe weight loss, persistent vomiting and epigastric pain. Following clinic review she developed a progressive paralysis and sensory loss of her left leg requiring emergency admission. Within one week this progressed to involve all four limbs. Clinical examination demonstrates a profound sensory ataxia, severe pseudoathetosis, nystagmus and bilateral weakness.

Nerve conduction studies demonstrated severe, predominantly sensory neuropathy. One week following admission the patient exhibits clear visual hallucinations, profound retrograde amnesia and marked confabulation, consistent with Wernicke-Korsakoff syndrome. Following intravenous thiamine replacement she demonstrated progressive improvement in her sensory ataxia and mild improvement in her confabulation and amnesia. Blood results ultimately confirm a marked thiamine deficiency.

**Discussion:** This case clearly depicts an atypical acute presentation of thiamine deficiency, previously labelled dry Beriberi. Few cases have been described in the literature, which are not as a result of alcohol abuse. In this lady it was felt that a combination of background peptic ulcer disease, chronic hepatitis and an acute gastroenteritis precipitated the acute clinical presentation.

**Conclusion:** Thiamine deficiency can rarely present as a rapidly progressive sensory neuropathy and this needs to be remembered in the differential of Guillain-Barre syndrome when considering this clinical picture in an individual with recent weight loss and poor oral intake.

### Subacute Subdural Haematoma – Should CT head guidelines include additional criteria?

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**Background:** Head injury is a common presentation in the emergency setting. This case highlights the pitfalls in adhering to guidelines too rigidly.

**Case:** A 90 year old man presented to A&E with a head injury after a mechanical fall. His GCS was 15, there was no history of loss of consciousness, amnesia, vomiting or seizures. He was not on any anticoagulants. On examination there was moderate left periorbital swelling and contusions but no signs of focal neurological deficit or depressed or basal skull fracture. After review of the patient with the registrar it was decided that the patient did not fit criteria for a CT head and was thus discharged with advice to his wife to bring him back if there were any signs of deterioration. Two days later he presented to A&E with a GCS of 6 and CT head showing subdural haematoma. He sadly passed away hours later.

**Discussion:** Due to objective criteria for a CT head not being fulfilled, this patient missed a potential lifesaving intervention. This patient was elderly and had recent platelet count of 84 – these are both risk factors for developing a subdural haematoma which are not taken into account by NICE guidelines unless there is loss of consciousness or amnesia.

**Conclusion:** It is important to highlight that guidelines are not a replacement for clinical judgement, both be used in conjunction. This case provides some evidence to suggest additional criteria for a CT head in patients with risk factors for developing subdural haematomas.



**"The unusual DVT"**

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A 73 year-old lady presented with a one day history of discoloration and severe pain of her left leg. She had noted to have a reduce appetite and weight loss prior to this. On examination, she had gross oedema, paraesthesia to her left foot, with an 8-second capillary refill time. Left leg was dusky in colour and cold. It was initially thought of an arterial thrombus however her risk factors were low.

An unusual presentation of a large venous thrombus, which mimics the manifestation of an arterial thrombus, known as phlegmasia cerulea dolens (PCD) was diagnosed. She was commenced on treatment dose low molecular weight heparin and urgent CT abdomen/thorax/pelvis arranged while waiting for vascular input. CT revealed a right renal tumour, pulmonary metastasis and an almost complete obstruction of the IVC, with intramural thrombus extending down to the left iliac and femoral veins.

PCD, also known as the blue phlebitis, is an uncommon but potential life-threatening form of an iliofemoral thrombosis, causing the venous outflow of the leg to be obstructed. In severe cases, approximately 25% could result with gangrenous limb. It is reported to be associated with several conditions, such as neoplasm, cardiac valvular disease, infection and oral contraceptive pill<sup>1</sup>. Treatment options for PCD are anticoagulants, thrombolytic therapy or venous thrombectomy.

This is an unusual case of a large venous thrombus that presented like an arterial thrombus. Hence it is worth further investigating as in this case it revealed the primary cause.

**Stress induced Graves' disease: a case report highlighting the pre and postoperative implications of subclinical thyrotoxicosis**

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**Background:** Graves' disease has long been associated with stress as a precipitant factor. Early recognition and management of thyroid disease in both the pre and postoperative periods is vital to minimise the risk of development to thyroid storm following acute trauma or surgery.

**Methodology:** A case report describing the rapid progression from a subclinical thyrotoxic state, to disabling Graves' disease with thyrotoxicosis and bilateral dysthyroid orbitopathy in the postoperative period. The case describes a 67-year-old female smoker, admitted electively on urgent basis for an open, high anterior resection for a rectal sigmoid adenocarcinoma who presented postoperatively with a persistent sinus tachycardia, palpitations and bilateral exophthalmos.

**Discussion:** Initial thyroid function tests demonstrated a free T4 52.3 pmol/l and TSH < 0.05 mU/l, with TPO and TSH antibody levels raised at 176 IU/ml and 9.5 IU/l respectively. A Burch-Wartofsky-Score was 35 prior to successful medical management with 10mg propranolol and 30mg carbimazole daily. Closer investigation into her medical history highlighted a 12-month history of subclinical thyroid disease in addition to a previous occurrence of thyrotoxicosis postoperatively to a total abdominal hysterectomy and bilateral salpingo-oophorectomy.

**Conclusions:** This case highlights the importance of careful preoperative assessment and appropriate management of thyrotoxicosis in addition to the implications in the postoperative period of uncontrolled thyroid disease. It demonstrates that acute trauma can precipitate clinical progression to thyrotoxicosis from a subclinical state. It also raises the question of appropriate investigation and management of subclinical thyrotoxicosis in the urgent preoperative setting.

### Hereditary Angioedema Presenting as Acute Appendicitis – A Case Report

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**Background:** Hereditary angioedema (HAE) is an autosomal dominant disease characterised by self-limiting, tissue oedema. Mutations of the C1-inhibitor gene causes unmoderated activation of the complement cascade. When this tissue swelling affects the GI tract, abdominal attacks can present with severe pain. First-line treatment is with plasma-derived C1-inhibitor (pdC1INH) but as this is not widely available fresh frozen plasma (FFP) is commonly used.

**Discussion:** We report the case of a 17 year old girl with HAE, which had previously manifested with facial and leg oedema. She presented with a 10 hour history of periumbilical pain radiating to the right iliac fossa, anorexia, nausea and vomiting. Blood tests showed a leucocytosis, white cell count of 16.5, and C-Reactive Protein of 6. A diagnosis of acute appendicitis was made and she underwent a laparoscopic appendicectomy with 2 units of FFP preoperatively. Operative findings showed a macroscopically normal appendix but extensive serous abdominal fluid and an oedematous jejunum/proximal ileum. Post-operatively her symptoms resolved and she was discharged the next day. Histology revealed a normal appendix.

**Conclusion:** We suggest that in patients with a family or personal history of HAE, an abdominal CT scan should be performed in suspected appendicitis to avoid inappropriate operative intervention. We also highlight the importance of taking a formal family history as part of a surgical workup. Surgical awareness of this medical cause of acute abdomen needs to be encouraged with greater availability of pdC1INH. In time, evidence based guidelines will need to be developed for the management of HAE

### Bilateral Facial Nerve Palsy

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**Introduction:** Facial nerve palsy (FNP) is characterised by ipsilateral facial asymmetry, loss of taste of anterior two-thirds of tongue and abnormal eye closure. In contrast to its unilateral counterpart, bilateral FNP occurs infrequently but commonly signifies more serious systemic disease.

**Case study:** We report an interesting case of acute onset of bilateral FNP in a 25 year old female patient with hypothyroidism and recently diagnosed type 1 Diabetes Mellitus. She presented with facial weakness following a non-specific prodrome and developed generalised weakness, numbness and paresthesia, affecting the upper limbs more than the lower limbs. Thorough investigation revealed the only abnormality to be elevated protein and glucose in her cerebrospinal fluid. She was therefore treated for suspected Guillian-Barre syndrome (GBS).

**Discussion:** Bilateral FNP is thought to manifest from underlying systemic disease in contrast to Bell's palsy which is usually idiopathic. The vast differential diagnoses necessitate thorough clinical evaluation and extensive investigation to exclude life threatening causes such as Lyme disease and GBS. Despite the atypical nature of her presentation, her facial paralysis and neurological symptoms slightly improved with intravenous immunoglobulins and steroids. She was discharged with residual bilateral facial paralysis with complete resolution of all her other neurological symptoms.

**Conclusion:** Bilateral FNP commonly manifests as part of an underlying systemic condition. Prognosis of Bilateral FNP is heavily influenced by the aetiology therefore thorough investigation and empirical treatment of life-threatening conditions such as GBS is fundamental to the timely, effective management of these patients

**DCIS Recurrence With Microinvasion: A Case Study**

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Breast cancer accounts for the most diagnosed malignancy in women across the globe, also being the second highest cause of cancer mortality in this sex group. Ductal carcinoma in situ (DCIS) only accounted for around two per cent of carcinomas found in the breast 25 years ago, before the National Health System began screening for breast abnormalities using mammography. Since this time the incidence of diagnosed DCIS cases has risen by over ten times this figure. A 57 year old woman with a five year history of DCIS is found to have high-grade recurrence of the condition, and is given the option of a fourth surgery to remove malignant foci discovered in her right breast. Some research suggests DCIS over time can progress to invasive breast cancer (IBC), while other studies argue otherwise, and believe too much focus is placed on low-grade DCIS cases. This case raises awareness of the concept that DCIS can often be over-treated, however sometimes as in this patient, radical surgery may be the only option to remove all risk of pathological recurrence.

**"An uncommon manifestation of Alpha-1-antitrypsin deficiency"**

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A 29 year old female presented with a 4 years history of recurrent painful nodules on her legs and arms, which worsened after she gave birth 8 months prior.

On examination, there was a deep overhung and purple edge ulcer noted on the right medial calf with indurated plaques on the legs and scars from previous lesions suggestive of either a liquefying ulcerating panniculitis or pyoderma gangrenosum.

Biopsy of a lesion showed mild fibrosis and perivascular infiltrate, composed of lymphocytes, histiocytes and eosinophils. Septal and lobular panniculitis with fat necrosis were noted in the subcutis, with foamy macrophages, histiocytes, scattered lymphocytes and eosinophils with lipophagic granulomas.

Alpha-1-antitrypsin (A1AT) level was low at 0.26g/l (1-2.1). The patient was diagnosed with panniculitis secondary to A1AT deficiency. A1AT Pi testing revealed the patient was PiZ. The patient was initially treated with steroids and subsequently doxycycline, which stopped her flare ups.

Alpha-1-antitrypsin is mainly synthesized in the liver and is a principal protease inhibitor in the serum. Its deficiency presents in different forms, typically panacinar emphysema but also as liver cirrhosis, noninfectious hepatitis and persistent vasculitis. Although the classical histopathology of A1AT deficiency associated panniculitis is neutrophilic panniculitis, late stages may present with scarring and fibrosis, as in this case.

The aim of the treatment is to correct the protease-antiprotease imbalance. Oral Dapsone is commonly used as the first-line treatment, as it interferes with myeloperoxidase which inhibits anti-trypsin. Tetracyclines can also be used, and alpha-1-protease inhibitor is commonly reserved for severe resistant cases.

### Lemierre's Syndrome secondary to Group A Streptococcus: a case report

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Lemierre's syndrome, or postanginal sepsis, is a rare clinical entity in which an oropharyngeal infection leads to thrombophlebitis of the internal jugular vein (IJV) with subsequent bacteraemia and septic embolization. The classical pathogen ascribed to Lemierre's syndrome is the bacterium *Fusobacterium necrophorum*, a gram-negative anaerobe. However, although extremely rare, other bacteria have now been cultured in isolation in patients with Lemierre's syndrome. This may reflect difficulties in culturing *F. necrophorum* or may support the role of other bacterium in the pathogenesis of this condition. The case presented here is of a 2-year-old boy with thrombophlebitis of IJV and sigmoid sinus. A diagnosis of Lemierre's syndrome was made following computed tomography imaging and Group A *Streptococcus* was the only bacterium isolated in culture. The patient was treated with antibiotics and LMW heparin and made a full recovery. The scientific literature of Lemierre's syndrome is reviewed and discussed in the context of the intriguing and rare case presented here.

### Two Interesting Cases of Takotsubo's Cardiomyopathy: Typical and Variant

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**Background:** Takotsubo cardiomyopathy, also known as stress cardiomyopathy and transient left ventricular (LV) apical ballooning syndrome, is a unique relatively rare syndrome initially described in 1991. It is characterised by transient LV dysfunction, chest pain with or without associated dyspnoea, electrocardiogram changes often ST-segment elevation, T wave inversion and pathological Q waves, and finally an elevation of cardiac enzymes importantly, in the absence of any obstructive coronary artery disease.

**Discussion:** This case report describes two interesting cases of takotsubo cardiomyopathy the first in a 60-year-old woman who was diagnosed with an 'atypical' variant; LV angiography showed moderately impaired LV function, significant ballooning and hypokinesia in left ventricular basal segments. The second in a 72-year-old woman with 'typical' takotsubo characteristics on LV angiogram; apical ballooning with marked left ventricular systolic dysfunction at the apex and apical regions. Both were admitted after stressful events and were initially treated as acute coronary syndrome (ACS) and later were finally diagnosed with takotsubo cardiomyopathy after angiography showed normal coronary arteries.

**Case summary/Conclusion:** Takotsubo cardiomyopathy is an important differential diagnosis of patients presenting with ACS which all clinicians should be aware of especially in post-menopausal women over the age of 50 with a recent stressful event. The vast majority of patients have a complete recovery and normal LV function returns within days to weeks, it also very rarely reoccurs. Treatments involve empirical medication therapy which should be tailored to patient's individual symptoms.

**New onset Schizophrenia in adolescents – A diagnostic challenge**

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**Background:** Schizophrenia has an insidious onset in childhood & adolescence and as the symptoms overlap with metabolic, developmental, behavioral, and cognitive disorders, the diagnosis can be challenging. We share our experience of such a case where schizophrenia was diagnosed with great difficulty.

**Case report:** An 18-year-old girl was referred to psychiatry, with cognitive decline, and psychotic symptoms. She was born normal with mildly delayed speech, verbal dyspraxia and problem solving difficulties. These symptoms improved with occupational and speech therapist input. There was no family history of psychiatric problem or learning disabilities. Initially parents related her symptoms to the death of her grandfather. She continued to have strange behaviors and delusions when admitted to psychiatric services. Her IQ was 57. She was started on anti-psychotics, which improved symptoms but she developed a rash and alopecia necessitating stopping of medications. She was referred to neuro-psychiatric and metabolic services and was found to have risen ANA, it was thought to be related to inflammatory disorder of CNS. She was commenced on cyclophosphamide and prednisolone for six months with plan to continue on Methotrexate. After six months, patient showed no significant improvement and the investigations were inconclusive. The case was discussed in MDT and help was sought from department of Psychiatry with learning disabilities. She was eventually diagnosed to have hebephrenic schizophrenia. The methotrexate was stopped and the patient showed symptomatic improvement with Clozapine.

**Conclusion:** A multidisciplinary approach is crucial in the early diagnosis and management of adolescent onset schizophrenia

**The 'Start Time Matrix': Did it work, or is it common sense after all?**

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Upper extremity deep vein thrombosis (UEDVT) is a rare occurrence in healthy individuals without a pre-existing anatomical abnormality or haematological predisposition. We report a case of bilateral UEDVTs in a young, otherwise healthy patient undergoing conservative management (figure-of-eight bandaging) for bilateral closed mid-shaft clavicle fractures. Four days following the initial injury he presented with increased pain and swelling around both shoulders and arms. Doppler ultrasonography demonstrated bilateral UEDVTs. He was commenced on anticoagulant therapy and his figure-of-eight bandage was removed. His symptoms settled and he made an uneventful recovery.

UEDVT can be associated with significant complications such as pulmonary emboli and post phlebotic syndrome..Cases of UEDVT have been reported previously in orthopaedic patients, but predominantly in the context of arthroplasty or trauma of the shoulder joint. This is the first documented occurrence of bilateral UEDVT in the context of clavicle fracture. Endothelial damage and a hypercoagulable state associated with the initial injury are proposed as possible aetiological factors. We hypothesise, in addition, that venous stasis resulting from an ill fitting figure-of-eight bandage is a likely contributory factor.

Clinicians treating patients with figure-of-eight bandaging should remain vigilant for UEDVT and initiate treatment promptly given its significant morbidity. Appropriate application without inadvertent constriction of the upper limb venous system must be ensured. Furthermore, use of a simple sling should be considered as treatment outcomes are comparable between.

### Undiagnosed Systemic Lupus Erythematosus in a 25 year old male requiring multi-organ support in intensive care

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This case report describes an atypical presentation of SLE and the complicated task of obtaining the diagnosis in a patient without previous signs or symptoms. Although the diagnostic conundrum of SLE is well documented, the challenges of each case are important to describe in order to improve its diagnosis.

A 25 year old male was admitted with nausea, vomiting, pyrexia, and lethargy present for 3 weeks. Over a further 1 week period he developed tachycardia, dyspnoea, hypotension, type 1 respiratory failure, tonic clonic seizures, pancytopenia, elevated bilirubin and liver transaminases, lactic acidosis, a pericardial effusion, axillary lymphadenopathy and acute kidney injury.

Investigations ruled out a pulmonary embolus, intra-abdominal and infectious bowel pathology, hepatitis, infective endocarditis, bacterial meningitis, lymphoma, malaria, EBV, HIV, CMV, syphilis, thyroid dysfunction and autoimmune haemolytic anaemia as the causative pathology.

The patient spent 4 weeks in intensive care for supportive treatment of his multi-organ dysfunction (respiratory, cardiovascular, hepatic and renal). Anti-TB treatment was commenced but a definitive diagnosis remained elusive. Immunological investigations highlighted antibodies present to dsDNA (elisa), Ro, smooth muscle and RNP, with negative antibodies to La and dsDNA crithidia. ESR was elevated, with a normal CRP. Examination did not elicit any signs of SLE and the patient denied previous symptoms of the disease. Corticosteroid treatment was initiated for a diagnosis of SLE based on the laboratory findings.

**Summary:** This case highlights an atypical presentation of SLE, one which required a lengthy intensive care stay with multi-organ support in a young, previously fit and well man.

### Lessons Learnt from Management of Chest Injuries in Gaza City

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**Background:** Chest injuries account for 20-25% of deaths due to trauma and contribute to 25-50% of the remaining trauma-related deaths.

**Aims:** To study mechanisms of injury, presentations, diagnosis, triaging, management and outcome of chest injuries at Al Shifa' Hospital.

**Methods:** We retrospectively reviewed management and survival as the main outcome measure of 183 consecutive chest injuries presented to Al Shifa Hospital between 2010 and 2012.

**Results:** 85% were males with average age of 30.53 years. 68 cases had deep penetrating chest injuries (PCI). The mechanisms of injury included gunshot- or blast- related (GSI, BRI) in 34 cases, stab injuries (SI) in 43 cases, traffic accidents in 27 cases, 46 falls from height, altercations in 28 cases and 5 others. 172 victims sustained a lateral or thoracic (T) injury, 3 patients suffered a central or mediastinal (M) injury while 8 sustained combined lateral and central injuries (T+M). 32 of the first group (T) were treated surgically with thoracotomy +/-laparotomy, and chest tube (CT). In the second group (M) the pericardium, the heart or any of the great mediastinal vessels were involved and the 3 were managed surgically. The 8 in the third group (T+M) were managed surgically. One died in the thoracic group, none in the mediastinal group and 3 in the (T+M) with overall peri-operative mortality of 2.2%. Survival in patients presented alive with recordable systolic blood pressure (SBP) on arrival was approximately 99.4%.

**Conclusions:** An expeditious surgical intervention in life-threatening thoracic trauma save lives. Mixed thoracic and Mediastinal blunt chest injuries are poor prognostic indicators.



**Macrophage Activation Syndrome presenting as a complication of Adult Stills Disease**

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Adult Stills disease (ASD) is a systemic inflammatory disorder of unknown aetiology which typically affects 16-35 year olds. Rarely, it may be complicated by the development of Macrophage Activation Syndrome (MAS), a multisystem inflammatory syndrome caused by massive cytokine release from activated lymphocytes and macrophages. This report describes the case of a 31 year old nurse who presented with a 3 week history of arthralgia, myalgia, fever and sore throat. ASD was diagnosed and the patient commenced on oral Prednisolone. The patient was readmitted 7 days later following 3 days of significant diarrhoea and deterioration in symptoms. The patient was haemodynamically unstable. Serum ferritin was grossly elevated and liver function tests significantly deranged. Haemoglobin and platelet count fell acutely with associated hypo-fibrinogenaemia and coagulopathy. A bone marrow biopsy demonstrated haemophagocytosis. A diagnosis of MAS was made. The patient was transferred to ICU where she received an IV immunoglobulin infusion and packed red cell, cryoprecipitate and FFP transfusion. IV Methylprednisolone was continued and Cyclosporine commenced. She stabilised on this therapy. To treat the underlying problem of ASD the patient was commenced on the Interleukin-1- receptor antagonist Anakinra. She improved markedly over the course of the next week and continued to remain well with ASD in remission at 4 month review.

This case adds to the growing evidence base regarding treatment of MAS and ASD. It highlights that the clinical picture of MAS may mimic sepsis and must be considered as a differential diagnosis in an unwell patient with underlying autoimmune/inflammatory disease.

**Plasmapheresis; a main treatment for Thrombotic Thrombocytopenic Purpura**

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**Background:** Although thrombotic thrombocytopenic purpura is not a common disease, it still has serious complications especially on the neurological and renal systems. The use of plasmapheresis shows a powerful effect for treatment.

**Discussion:** A 42 years old Caucasian woman patient, named H. A. A., showed neurological manifestations in the form of: heaviness of the right upper limb as well as heaviness in the tongue and then loss of consciousness. Complete blood count and other investigations were done and revealed thrombotic thrombocytopenic purpura. The patient received the usual treatment in the form of blood, fresh frozen plasma and platelets transfusion but she did not improve. After plasmapheresis, the patient showed significant improvement.

**Conclusion:** Plasmapheresis was proved by trial to be an effective method for treatment of the thrombotic thrombocytopenic purpura.

**Decidualisation of ovarian endometriomas in pregnancy: a management dilemma. A case report and review of the literature.**

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Complex ovarian masses in pregnancy are uncommon with endometriomas accounting for approximately 11.5% of these lesions. During pregnancy increased progesterone levels may result in decidualisation of endometriomas, which occasionally mimic malignancy on imaging resulting in a management dilemma.

An ovarian cyst was noted on USS in a 33 year old woman at 12 weeks gestation. Reviewed at 16 weeks, suspicious features remained on imaging and CA-125 was elevated to 77u/ml. Serial monitoring undertaken; at 18 weeks gestation, TVS and MRI showed a unilocular mass of increasing size with features suggestive of early ovarian malignancy. Extensive debate ensued at gynaecology multi-disciplinary team meeting regarding the nature of the mass and close surveillance recommended. The cyst was monitored throughout pregnancy with serial TVS 4 weekly and repeat MRI with intervention reserved if patient became symptomatic. Caesarean section at 38 weeks delivered a healthy male neonate. Frozen section of the ovary was benign and histology confirmed a decidualised endometrioma and benign dermoid cyst.

Literature search was undertaken to evaluate existing evidence for decidualised ovarian endometriomas in pregnancy. 14 papers were identified reporting on 26 cases excluding the index case.

Surgery during pregnancy offers histological diagnosis but may introduce risks to mother and fetus; conservative approach is worrisome but avoids interventions during pregnancy. Elective caesarean section following monitoring throughout pregnancy may bridge the gap between surgical and purely conservative approaches.

Limited evidence makes a definitive decision regarding management difficult; however, decidualisation should be considered as a differential for suspicious ovarian lesions in pregnancy.

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