



*Special Edition*

# WJMER

World Journal of Medical Education and Research

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

## 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

### Introduction

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

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## Poster Presentations

### Re-audit of potential antidepressant adverse drug

Hayter V\*; Green A; Taylor N; Gibbs K; Potokar J

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Previously, our audit of NICE Guidelines (CG91) demonstrated that antidepressants are co-prescribed with medications that could cause adverse drug reactions. We re-audited prescribing to assess the impact of the following action points after 6 months: teaching hospital doctors about common antidepressant drug interactions; including information about potential drug interactions in discharge summaries.

Data was collected by pharmacists on one day from all patients prescribed an antidepressant using a revised audit tool. Prescribed medications and information regarding history of upper gastrointestinal haemorrhage (UGIH) or confusion in patients on certain drugs were collected from patient notes.

83/845 patients (10%) were prescribed an antidepressant. Most antidepressants were prescribed prior to admission. More patients were co-prescribed an NSAID/aspirin and an SSRI/SNRI in the re-audit. 8/83 (10%) patients had a history of an UGIH. 19/83 were prescribed an SSRI/ SNRI and aspirin or an NSAID. 2/19 (10%) of these patients had a history of UGIH and only one of these patients was co-prescribed gastro-protective cover. Fewer patients were co-prescribed an SSRI/SNRI/TCA and tramadol in the re-audit (26% vs. 18%). 23/83 patients had a history of confusion during this admission. 4/23 (17%) were over the age of 65 and taking amitriptyline.

This re-audit shows that potentially hazardous co-prescribing with antidepressant medication continues in the UHBT. This highlights the need for training GPs, since most antidepressants were prescribed before admission. By identifying potential adverse events from hazardous co-prescribing, it demonstrates the importance of auditing this practice and implementing change.

### Pre operative fluid management: Staff and patient knowledge and effect on renal function

Ward E\*; Killean A

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**Background:** With fast-track operations and discharges becoming more popular a closer look at medical care, pre and post operatively, recently changed fluid guidance. Guidance now states fasting time for clear fluids is 2 hours (1). This was an audit to assess knowledge of healthcare staff and patients regarding pre-operative fluid fasting prior to elective hip and knee replacements.

**Design:** Questionnaires to staff and patients regarding fluid fasting. For staff this included knowledge of national and local guidelines and the importance of fluid management. For patients this assessed their fluid intake pre operatively and knowledge of fasting information. Renal function was checked pre and post operation using urea and creatinine.

**Results:** Cycle one found that 81.8% of staff knew the guidelines whilst only 38% of patients understood the guidance. It found an average fasting time of 6.37 hours. Cycle two introduced a patient leaflet on admission and reduced fluid fasting times to 4.8 hours. It also found that those who fasted longest were those first on the list- usually those with greater co-morbidities. No significant correlation was found between renal function and fluid fasting though encouraging good pre-operative hydration has been shown to 'improve patient well being' (2) and aid 'enhanced recovery'. (3)

**Conclusion:** Clear information on admission regarding fasting is beneficial as pre assessment information may have been forgotten or overlooked during the waiting period.

### Do Cystic Fibrosis (CF) patients who visit the dentist regularly have a better lung function?

Khattak S\*; Daniels T

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**Aims:** The audit aims to determine whether CF patients under the care of the University Hospital Southampton CF team, visit the dentist regularly and it's impact on their pulmonary health.

**Background:** At annual reviews, all CF patients are asked whether they visit the dentist regularly and are offered advice on the importance of dental hygiene. Although little evidence is present on the origin of bacteria in the lungs of these patients, some theories suggest that the bacteria could be first colonised in the oropharynx and subsequently enter the lungs. Therefore, the CF team has incorporated a plan to ensure that all patients are counselled about the benefits of good oral hygiene.

**Methods and Results:** Annual reviews of 173 patients were accessed using online database. Simple bar chart was used to compare the number of patients visiting the dentist and whether they were given advice about the benefits of dental hygiene. 69% of the patients visit the dentist every 6 months (median=2.15, IQR=1.40). 31% of patients did not visit the dentist (median=2.60, IQR=1.57). 92% of the patients were counselled about the benefits of dental care. Using independent t-test, there was no statistically significant difference ( $p=0.992$ ) in  $FEV_1$  whether patients visited the dentist or not.

**Conclusion:** Most patients were successfully given advice about dental care and regular checkups. Even though, the relationship between lung function and dentist visits was not statistically significant, it is important for patients to look after their oral hygiene to prevent the oropharyngeal bacteria from entering the lungs

### Sepsis events after Transrectal Ultrasound guided (TRUS) prostate biopsy at The Royal Bournemouth Hospital

Abid N\*; Bromwich E; Phillips J

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**Background:** The British Association of Urological Surgeons (BAUS) quotes a 2% septicaemia complication rate and a 10% urinary tract infection (UTI) rate post TRUS prostate biopsy in men undergoing investigation of suspected prostate cancer. An audit of our sepsis rates for this procedure was commenced at the Royal Bournemouth Hospital (RBH), during which the antimicrobial guidelines were changed and the impact assessed.

**Methods;** Retrospective audit of 579 consecutive cases identified over a seven month period. The individual records of all cases investigated for UTI and sepsis within 30 days of their procedure were retrieved and data collated.

**Results:** Out of the total 579 patient cohort, 14 (2.4%) were readmitted with septic complications. With our original prophylactic antibiotic therapy pre-procedure (ciprofloxacin 500mg and metronidazole 400mg), 10 out of 279 (3.6%) patients were readmitted with sepsis. After increasing the ciprofloxacin dosage to 750mg this then fell to 4 out of 300 (1.3%) patients. Median interval from biopsy to hospitalisation was 48 hours. An 83% ciprofloxacin resistance was identified from the microbiology blood culture results.

**Conclusion:** The change in antibiotic prophylaxis policy appears to have lowered our sepsis complication rate to less than the BAUS standard. Currently a re-audit is being undertaken for the next cycle of data.

The high prevalence of fluoroquinolone resistance demonstrated from this audit is concerning and has also been reported in other series. To address this, data has been shared and discussions are currently underway with our microbiologists to examine this in more detail.



**A study to assess Foundation Year (FY) doctor handover procedure**

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**Background:** General Medical Council guidance states FY doctors must have formal handover and local induction at the beginning of placements. This is reinforced by the National Health Service Litigation Authority who recognise lack of inductions to new placements may lead to mistakes, ultimately compromising patient safety. This study aimed to assess first year FY doctors (FY1s) handover procedure and attitudes at a teaching hospital.

**Method:** An anonymised 9 point questionnaire was given to 36 (FY1) doctors at a teaching hospital to complete, of which 28 were returned. The results and comments were collated in an Excel spreadsheet, interpreted and relayed to both the postgraduate co-ordinators and sample group.

**Results:** All FY1s agreed that they would benefit from a handover, and all but 2 agreed a basic performa would help facilitate this. Of the 28, 92% received some sort of handover, and the majority of FY1s who did not write a handover stated it was because they didn't have enough time to complete one. 68% wished their handover documents to be kept private from postgraduate staff. Common complaints in the comments section included insufficient patient list handover. 2/3 of FY1s did not feel their predecessor had enough time to run through their written or verbal handover.

**Discussion:** This study showed the majority of FY1s want a handover, and feel they would benefit from protected time to both write and receive placement handover- be it verbal or written handover. Better handover may ensure greater confidence and reduce mistakes made in new placements

**The diagnostic work up of stable chest pain at the UHW**

Sen G

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**Background:** Chest pain (CP) needs a prompt diagnosis. NICE published new guidelines in 2010, proposing a new method for the assessment of stable CP. The aims were to compare the assessment of stable CP at the UHW with the NICE guidelines.

**Methods:** The audit was undertaken by retrospectively reading clinic letters of patients having coronary angiograms (CA). The letters were used to determine the type of CP, cardiovascular risk-factors and ECG details. The likelihood of coronary artery disease (CAD) was calculated as published by NICE.

Depending on the calculated CAD risk probability, the NICE-suggested investigation was determined: No investigations (<10% risk), calcium scoring (CS) (10-29% risk), functional imaging (30-60% risk), CA (60-90% risk), treat as angina (>90% risk). To compare the deviance from NICE, the actual investigations undertaken for each patient were noted.

**Results:** 299 patients were included. 178 met the audit criteria of having CP; 61% male; median age 65 (range 37-88) years. 97 (54%) had exercise tolerance test (ETT), 14(8%) functional testing and 67(38%) angiogram, a large deviation from the NICE guidelines. According to NICE 4% should have had no investigation, 8% CS, 11% functional imaging, 23% CA and 53% should have been treated as angina.

**Conclusion:** If the NICE guidelines were implemented at the UHW, functional imaging and CA would be the main investigations required for assessing stable CP, and ETT would be disregarded. This would mean a dramatic change in how stable CP is being assessed and would be a huge financial burden on the NHS.

### Impact of trainee involvement with robotic-assisted radical prostatectomy

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**Background:** Robotic-assisted surgery has been rapidly adopted within urology. The challenge is to effectively train residents and fellows to perform robotic-assisted surgery without compromising outcomes. We evaluated the perioperative outcomes of trainee involvement with robotic-assisted radical prostatectomy (RARP) within our institution.

**Methodology:** We retrospectively reviewed RARP cases performed between 09/2008-12/2010 using a single da Vinci robotic platform. Trainees consisted of urology residents and fellows who operated with staff surgeons on select operating days, whereas two staff surgeon teams performed RARP on alternate days. We compared clinicopathologic variables: operating time, estimated blood loss, surgical margin rates, complication rates between the trainee and staff-only surgeon groups.

**Discussion:** Overall, 1019 RARP surgeries were performed within this period and trainee participation was 16% (162 cases). Clinical characteristics were similar between both cohorts. Positive surgical margin rates were lower for patients with pT2 disease for cases with trainee involvement (11 vs. 19 %,  $p = 0.02$ ), although overall margin rates and margin rates for patients with pT3 disease were similar between the groups ( $p = 0.34$ ). Cases involving trainees were longer (241 vs. 200 min,  $p < 0.001$ ), resulting in higher estimated blood loss (190 vs. 120 mL,  $p < 0.001$ ) than the two staff surgeon cases. However, transfusion rates, intraoperative and postoperative complication rates didn't differ significantly between groups.

**Conclusions:** Surgical margin rates were lower in teaching cases for patients with pT2 disease. Importantly, trainee involvement in RARP is safe with similar perioperative outcomes to staff-only surgical cases. This information may be useful for training and surgical planning.

### Rosai-Dorfman disease and oligoarthritis: a case report

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Sir, we submit a case report of a 41-year-old woman with sinus histiocytosis with massive lymphadenopathy (SHML, Rosai-Dorfman disease), who presented with cervical lymphadenopathy and inflammatory joint pain for 2 weeks. Her history included spiking fevers with profuse night sweats, and travel to Asia in the last 3 months.

On examination, she had gross cervical lymphadenopathy, and boggy swelling around her right elbow and ankle, which were both hot and tender on palpation. Aspiration of the elbow showed numerous leukocytes with no crystals or organisms seen. Histological examination confirmed large histiocytes with abundant foamy cytoplasm engulfing lymphocytes and plasma cells (emperipolesis). Immunohistochemistry illustrated these to be CD68- and S100-positive, indicating so-called SHML cells.

This is a rare, but well-defined disorder with only a handful of case reports showing association between SHML and clinical joint disease. The aetiology is unknown, and although the clinical manifestations and histological appearance are suggestive of an infectious process, no micro-organisms have yet been identified. The clinical picture suggests a reactive arthritis, T-cell lymphoma or a systemic inflammatory condition leading to arthropathy.

Given the rarity of the condition, the non-specific symptoms affecting multiple sites and frequent absence of cervical lymphadenopathy, clinicians often do not consider SHML in their differential diagnosis. This results in inappropriate treatment of this benign but sometimes progressive disease. In our patient, her symptoms improved with a course of naproxen and she was discharged 5 days later.

**Polypharmacy in a Scottish District Hospital**

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Polypharmacy is defined as co-prescription of  $\geq 4$  drugs. 80% of people aged  $>75$  years take a prescription medicine and 36% receive polypharmacy. Adverse drug reactions (ADR) are implicated in 5–17% of hospital admissions, and are particularly common in frail older adults. Three important areas in drug review are high-risk combinations, drugs poorly-tolerated in frail adults and drugs that may require discontinuation when dehydrated.

We reviewed admission and post-admission prescriptions for 100 consecutive admissions to an Acute Medical Unit in January 2013. For all patients taking  $\geq 12$  drugs on admission, we recorded age; gender; likelihood that an ADR caused admission; high-risk drug combinations; drugs poorly-tolerated in frailty; and drugs for review in dehydration. These last three were defined by the 2012 Polypharmacy Guideline.

2 patients died and 5 were discharged before data verification, leaving 93 complete sets. 45 (48%) were male. Mean age was 66 years: 58 (62%) were  $\geq 65$  years and 38 (41%) were  $\geq 75$  years. Median prescriptions at admission were 8. 76 (82%) were taking  $\geq 4$  drugs and 17 (18%) were taking  $\geq 12$ . 1/17 (6%) had an ADR: acute-on-chronic kidney disease triggered by fever whilst taking an ACEI with diuretic. 4/17 (25%) had high-risk combinations (NSAID, ACEI and diuretic; Warfarin plus azole; Warfarin plus macrolide; Warfarin plus Aspirin and Clopidogrel). 15/17 (88%) had drugs poorly-tolerated in frailty, including combination analgesics and anticholinergics. 13 (76%) dehydrated patients were prescribed drugs requiring review (ACEI, ARB, NSAID, diuretics and Metformin).

This review highlights the importance of careful drug review at admission.

**Ipsilateral Translaminar Screws inserted Bilaterally with Rod-to-Rod Connectors in Occipitocervical Fusion: A Technical Note with Case Series**

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**Objective:** We describe a novel technique of C2 translaminar screw insertion which is simple to execute, safe and enables rigid fixation with a rod construct. A case-report of 2 patients that underwent this technique was compiled to assess technical issues and patient outcomes post-operatively.

**Technique:** With a posterior approach, the spinous process of C2 vertebra is decorticated and used as an autograft for fusion. Translaminar screws are then inserted bilaterally in an ipsilateral fashion. This method improves accuracy by enabling direct visualization of the screw pathway during drilling. As the screw heads lie very medially, this makes it difficult to incorporate into the usual Occiput to C3 (or distal) rod. The use of a screw to rod connector makes this easy without having to contour the rod excessively. The risk of a laminar breach into the canal is less likely. For added stability, crosslinks are used in the construct. Iliac crest bone graft was used to promote speedy union.

**Case Report:** Two patients who underwent Occipitocervical fusion with this technique were reviewed. One had a combined occiput-C1 and C1-C2 dissociation while the other had a displaced C1/C2 fracture dislocation.

**Conclusion:** Occipitocervical fusion with bilaterally inserted ipsilateral translaminar screws into C2 vertebra was demonstrated to be safe, less technically demanding than the crossed technique, with improved accuracy in screw insertion due to better visualization. This lowers the risk of laminar breach and resultant damage to the spinal cord. Stability and rigid fixation is rendered by the screw-to-rod connector, thereby promoting fusion.

### Reversal of loop Ileostomy – A review of outcomes

Sproston A\*; Zaidi A; Harries RL; Hilton J  
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**Aims:** Major complications following loop ileostomy reversal can occur in up to 9% of cases. The aims of the study were to assess outcomes following loop ileostomy reversal in our unit.

**Methods:** Retrospective review of consecutive patients undergoing elective loop ileostomy reversal between Jan 2006 to Jan 2013. Demographic data, anastomotic technique, length of stay, complications and 30-day mortality were recorded.

**Results:** 67 patients underwent elective loop ileostomy reversal over the time period. 45 were male and 22 were female. Median age was 65 years (range 20-83). Indication for the ileostomy formation was low anterior resection for rectal cancer in 54 cases, ileo-anal pouch formation for Inflammatory Bowel Disease in 7 cases, and 6 miscellaneous cases. Median length of wait between ileostomy formation and reversal was 266 days (range 49-1317 days). Length of wait for reversal was not affected by post-operative chemotherapy, radiological leak or stricture formation requiring repeated dilatation ( $p=0.4555$  unpaired t-test). Hand sewn anastomosis was performed in 13 cases and stapled in 54 cases. Median post-operative length of stay was 5 days (range 1-23). 4 patients had anastomotic leaks and 2 had bowel obstruction requiring intervention; resulting in a major complication rate of 4.02% (Clavien-Dindo Classification III-V). No statistically significant difference was seen between anastomotic technique and major complication ( $p=0.5743$  fisher exact test). 30-day mortality rate was 0%.

**Conclusions:** Median length of wait between loop ileostomy formation and reversal was eight months. Our major complication rate following reversal of loop ileostomy was comparable to published data. There was no significant difference in major complication rate comparing anastomotic techniques

### Beyond the ABC approach: A preliminary cross-sectional study highlighting gaps in understanding of paediatric trauma management

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**Background:** Most training for Paediatric trauma is focused on the Airway, Breathing, Circulation (ABC) approach; a clinical model for resuscitation in emergencies. In many hospitals, the Paediatric trainee doctor has a key role in trauma management, but their level of understanding has rarely been investigated before.

**Method:** This cross-sectional study examined the working knowledge of trauma management in a cohort of 25 Paediatric trainees. Each participant completed a timed, unannounced question paper before a teaching session on trauma. The test was designed to examine areas of the ABC model and beyond, including mechanisms of injury and coagulopathy. The tests were marked anonymously by an invigilator with a defined mark scheme, as agreed with a Paediatric Intensive Care consultant.

**Results & Discussion:** The results showed strengths in airway and breathing management as emphasised in the ABC model with an average mark of 76%. However, significant gaps in knowledge were identified in basic mechanisms of injury, coagulopathy in trauma, and C-spine management (average mark of 40%). For example, 9/25 responses stated they would unnecessarily delay giving platelets in trauma until they had a platelet count. A lack of knowledge on *trauma-specific* resuscitation guidelines should be addressed in the trainees' teaching to ensure good patient outcomes.

**Conclusion:** Despite the preliminary nature of this work, it suggests important gaps in the understanding of trauma pathophysiology and management amongst paediatric doctors. Further baseline assessment and re-appraisal is urgently required to guide training and revalidation in these areas, especially around coagulopathy and management of bleeding.



**Investigating the Role of Matrix Metalloproteinases (MMPs) and Heat Shock Proteins (HSPs) in Postpartum Uterine Involution**

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**Background:** Following labour, the uterus rapidly returns to its pre-pregnancy state in a dynamic process known as postpartum uterine involution. Exact mechanisms underlying labour and postpartum involution are not fully understood but inflammation is understood to play a key role. It has been hypothesised that rather than initiating or propagating labour, inflammation may prime the uterus for extensive postpartum tissue repair and remodelling, in a manner akin to repair in exercising skeletal muscle. MMPs and HSPs are known to play a role in skeletal muscle remodelling after injury. Little is known about their role in the postpartum myometrium and this study aims to examine the expression of mRNA for MMPs (MMP2, MMP8, MMP9) and HSPs (HSP70, HSP27, HSP60, HSP90) in the postpartum mouse uterus.

**Methods:** Uterine tissues of C57BL/6 mice were collected at Day 1 (n=5), 4 (n=6) and 7 (n=5) postpartum. Virgin females (proestrous stage) were used as non-pregnant controls (n=5). mRNA expression was determined by qRT-PCR. Differences were analysed by Kruskal-Wallis test, followed by Dunn's Multiple Comparison Test.

**Results:** A 3-fold increase in expression of Hspb1 (HSP27) at Day 7 postpartum ( $p=0.04$ ) and Mmp8 at Day 4 postpartum ( $p=0.03$ ) compared to non-pregnant samples was found. Expression of all other genes examined remained unchanged throughout the postpartum period.

**Conclusion:** HSP27 and MMP8 may have a role in postpartum uterine involution. This study provides a foundation for future research into the potential role of these proteins during the physiological process of uterine involution and muscle damage repair and remodelling

**RIF pain an unusual presentation of stercoral perforation of the sigmoid colon: Case report and extensive literature review.**

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**Aims:** We recently treated a 45 year old woman who presented with acute right iliac fossa (RIF) pain. At laparotomy she was found to have stercoral sigmoid perforation secondary to chronic constipation. Stercoral perforation is considered rare and information on best management is limited. This paper aims to systematically review the literature on stercoral perforation, reporting on demographics, aetiology, risk factors and management.

**Methods:** A MEDLINE search was performed using the PubMed interface and the search terms: Search (stercoral perforation) AND "case reports"[Publication Type]. Information on age, gender, predisposing factors, anatomical site, surgery, hospital stay, and mortality was extracted.

**Results:** 74 publications matched the search criteria. After exclusion of papers and cases that did not fit the inclusion criteria the data in this paper are based on the information extracted from 55 publications describing a total of 90 cases of stercoral perforation. The median age was 63.2 years (range 4 – 94), 62 were female and 28 male. The most common anatomical site of perforation, was the sigmoid (72%) and least common in the ascending colon (2%). In 58 cases predisposing causes were proposed: 23% were on NSAIDs, 14% taking opioids, 11% anticholinergics, and 5% calcium channel blockers. Fifty cases reported chronic constipation due to: inactivity (14%), neurological (9%), and medications (30%). The majority underwent a Hartmann's procedure and there was an associated mortality of 30%.

**Conclusions:** Stercoral perforation is not as uncommon as is often thought and can present with RIF pain. Most cases are associated with severe constipation and the associated mortality is high

### Patient recruitment and experiences in a randomised control pilot study of supervised exercise training in patients with small abdominal aortic aneurysm

Gunasekera R\*; Tew G; Moss J; Crank H; Mitchell P; Nawaz S

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**Background:** The purpose of this research was to outline the experiences gained from recruiting into a randomised controlled pilot study of supervised exercise training for patients with small AAA, with a view to informing recruitment strategies in future clinical trials. We also invited 6 individuals from the exercise group to take part in a focus group to share their experiences from participating in the study.

**Methods:** The pilot study aimed to recruit 60 patients with early AAA disease, to receive a 12-week programme of moderate intensity exercise or standard care control. Potentially eligible patient were identified at clinics where details were passed on by their clinician or via aneurysm surveillance list from a large NHS trust (Sheffield teaching Hospitals). Consequently they were sent a postal invitation to participate in the study followed by a telephone call if there was no reply to the letter.

**Results:** We identified 545 potentially eligible patients via our recruitment strategy. The response rate to invitation letter was 81.7% (N=445/445), of patients who responded and remained available and interested (N=108) 25.9% (N=28) were eligible to be randomised. 25 patients (89.3% of consenting patients) completed the study over the 12 week period. On the basis of recruitment via invitation letters we estimated the trial recruitment rate amongst eligible patients to be 13.8%.

**Conclusions:** The number of patients randomised was significantly lower than anticipated. We were able to identify and highlight valuable information for planning the recruitment of future trials involving similar populations

### Continuous subcutaneous hydrocortisone infusion in patients with poorly controlled adrenal insufficiency

Khanna A\*; Ray DW

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**Background:** Three patients with poorly managed adrenal insufficiency were trialled on continuous subcutaneous hydrocortisone infusion pumps on compassionate grounds. All three had previously required numerous hospital admissions for problems associated with inadequacy and adverse effects of oral hydrocortisone therapy.

**Methodology:** Hydrocortisone solution was infused using an insulin pump, and the delivery method was identical to that for continuous subcutaneous insulin infusion into the abdominal wall. Hydrocortisone doses were initially calculated based on body weight and previous oral dose requirements, and subsequently adjusted over a period of weeks, based on initially serum, and then salivary cortisol profiles.

**Discussion:** All three patients reported improved symptom control and had reduced hospital admissions through an eight month follow-up period to date. All reported a significant improvement in symptom control and quality of life. Unlike oral replacement therapy, which fails to mimic the normal circadian rhythm in serum cortisol concentration, continuous subcutaneous infusion delivers near-physiological cortisol replacement, with the added benefit of bypassing first-pass hepatic actions. Delivery pumps can however impose physical restrictions, and are costly. Nonetheless; the reduction in costs associated with less frequent hospital admissions may financially justify the use of such devices.

**Case summary/Conclusion:** In patients with poorly managed adrenal insufficiency, continuous subcutaneous cortisol infusion can be considered as an effective measure to help improve patient quality of life and reduce frequency of hospital admissions .

**Multicomponent Analysis of the Tumour Microenvironment of Early Stage NSCLC Patients Reveals Tenascin-C Expression in Fibroblasts as a significant risk factor in Shortened Post-Operative Survival**

Isherwood M\*; Onion D; Argent R; Grebowska A

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**Background:** The role of the Tumour microenvironment (TME) in NSCLC remains poorly defined. Nevertheless, the radical success of early trials of PD1/PD-L1 immunotherapy suggests that the TME has a guiding influence on NSCLC disease outcome and points the way for further exploration of TME-targeted therapies. Central TME constituents, cancer-associated fibroblasts (CAFs), can modulate tumour progression through induction of epithelial-mesenchymal-transition (EMT) and subversion of the immune system. Here we investigate correlations between the expression of proteins implicated in CAF pathogenesis (Caveolin-1 [Cav-1] and Tenascin-C [TNC]), markers of EMT (E-cadherin and vimentin) and overall patient mortality.

**Methods:** Immunohistochemical staining for Caveolin-1 and Tenascin-C expression was performed using FFPE sections of NSCLC tumour tissue. Proportions of stromal staining were determined using a blinded semi-quantitative method and staining intensity scores were determined by image analysis (ImageScope). Proportion and intensity of staining were correlated with tumour EMT status (E-cadherin and vimentin expression) and density and location of immune cells (T-cells, T-regulatory cells, and macrophages) as well as with overall patient mortality.

**Results:** We identified a reciprocal expression of TN-C and Cav-1 in CAFs. Furthermore, following multicomponent analysis, patients with identified EMT, and those patients with the highest grade of TNC staining had significantly reduced overall survival ( $p=0.0242$ , and  $p=0.0035$  respectively).

**Conclusion:** This study suggests that the TME, and CAFs in particular, can significantly influence NSCLC behaviour. There are also implications in the identification of patients with significantly shortened survival due to aggressive TME driven disease which may benefit from adjuvant TME targeted therapy

**Alcohol use in Major Trauma Patients in the Midland Region, New Zealand: An Institutional Review**

Harikrishnan A\*; Chan S; Christey G

*Research performed at Waikato Hospital, New Zealand*

The incidence, characteristics and context of alcohol related injury in major trauma patients in New Zealand is not well defined. A retrospective cohort study from prospectively collected trauma registry data from the Midland Region, New Zealand, was performed. Major trauma patients with International Severity Score (ISS)  $\geq 15$  admitted to Midland region hospitals between 01/01/2009 to 31/12/2010 were included. Patients were categorised into alcohol positive and negative groups. Variables examined included demographics, mechanism of injury, day and time of injury. 5,887 trauma admissions were recorded, 531 having an ISS  $> 15$ . The incidence of alcohol related major trauma cases were 24%. There was a statistically significant difference in age groups ( $p<0.001$ ), ethnicity ( $p<0.001$ ), days of the week ( $P<0.05$ ), time periods ( $P<0.001$ ) and mechanism of injury ( $P<0.001$ ) between alcohol positive and alcohol negative groups. Alcohol use was highest in the 20-24 age group, accounting for 54% of patients. Maori ethnicity had the highest alcohol positive rate (44%) followed by Europeans (17%) and other ethnic groups (7%). Alcohol was involved in more weekend (28%) than weekday (20%) major trauma admissions and between the hours of 00:00-03:59 (78%). Regarding mechanism of injury, assault only contributed to 6% of all major trauma admissions however, showed 76% alcohol positivity rate; 3.6 times that of Road Traffic Collisions. These findings highlight potential targets for public health interventions regarding alcohol consumption in the context of major trauma in New Zealand.

### First Aid for Epistaxis – the layman scratches his head!

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**Introduction:** Nosebleeds are a common occurrence, and generally well controlled by simple first aid measures. This study aims to evaluate the extent and influences on the knowledge of first aid for epistaxis, amongst members of the public in Malta.

**Methods:** Volunteers, recruited according to a probability quota sample, submitted to a structured interview detailing demographics, experiences, training and knowledge relevant to immediate care for epistaxis. Individual chi-squared tests were performed to relate knowledge to expected influences.

**Results:** 500 participants (47% male) were interviewed, of whom 34% (n = 169) had previously received formal training in first aid, and 9% had previously suffered a nosebleed requiring medical attention. Only 22% (n = 108) of participants indicated the appropriate site for application of direct pressure in an attempt to control a nosebleed, whilst 52% (n = 257) correctly indicated that the patient's head should be in a neutral or slightly tilted forwards position. Attendance to formal first aid training resulted in a higher incidence of correct head positioning (63% vs 45%,  $p < 0.001$ ), but registered no improvement in the ability to identify the point at which to apply pressure. Previous epistaxis requiring medical attention was not associated with any improvement in knowledge.

**Conclusions:** Much of the general population remains unable to provide effective simple first aid for nosebleeds. Previous first aid training is not associated with an improvement in management, and neither is a history of presentation to medical practitioners with epistaxis.

### Cost comparison between Robot Assisted Partial Nephrectomy and Cryoablation in patients with renal masses

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**Background:** Since the introduction of the Da Vinci, robot assisted partial nephrectomy (RAPN) has been rapidly adopted as the future in minimally invasive surgery. Few comparative studies comparing its purported advantages to other minimally invasive surgeries such as cryoablation have been adopted despite literatures indicating similar oncological outcomes. With advancements and vast implementations between both modalities, the cost differences remain unclear.

**Method:** A total of 100 consecutive patients which underwent RAPN or cryoablation from June 2008 to February 2012 were reviewed. Cost data for hospital length of stay (LOS), operating room (OR) time, surgical costs and professional fees were obtained from the institution to establish a cost model. Each modalities purchase cost and maintenance were also amortized to be included within the study.

**Results:** Both RAPN and cryoablation had 50 patients reviewed respectively. Mean OR time was 152 and 142 minutes ( $P = 0.207$ ); mean LOS was 2.46 and 1.73 days ( $P = 0.536$ ); mean mass size was 31.7 and 26.12mm ( $P = 0.004$ ); mean age was 61.74 and 69.80 ( $P < 0.05$ ) respectively.

**Conclusion:** Preliminary results indicate that cryoablation is more cost effective due to its lower instrumentation costs despite similar OR and LOS times. Significant differences in mass size and age correspond to the differences in patients eligibility for RAPN or cryoablation. The high cost of purchase, maintenance and instrumentation of the RAPN should be re-evaluated with its long term patient outcome and usage to warrant its future role

**Improving confidence in prescribing through practically focussed teaching**

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**Background:** Over 86,000 medication errors were reported to NPSA (National Patient Safety Agency) in 2007.(1) Almost 20% of these were made by Foundation Doctors, even though safe prescribing is a core component of the GMC's undergraduate curriculum.(2-4) A lack of training is associated with increased rates of prescription errors.(4)

**Methodology:** Current Foundation Trainees delivered a practical prescribing course to 8 final-year medical students, focusing on improving students' confidence in prescribing. Over 5 weeks, sessions covered Acute Coronary Syndrome, antibiotics, anticoagulation, fluid balance and hyperkalaemia.

Subjective feedback (measuring confidence out of 10 both before and after the session) was collected each week before the course was repeated to 9 different (but similar stage) students.

**Discussion:** Overall confidence improved by 4.4 and 3.9 points in Groups 1 and 2 respectively. Confidence improved most in treating hyperkalaemia. Feedback was positive, with students finding the course a useful addition to their other lectures.

**Conclusions:** Students still lack confidence in prescribing common medications at the end of the undergraduate courses. Many students have not used a BNF or written on a drug chart before sitting their final exams. Short courses focussed on the practical aspects of prescribing can significantly increase students' confidence in common prescriptions.

**Redesigning the Intensive Care Unit Discharge: A Quality Healthcare Improvement Project**

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Discharge from the intensive care unit (ICU) is a complex process. Patients discharged from ICU to wards have an increased incidence of clinical deterioration and mortality. Similarly readmission to the ICU is associated with poor outcomes and increased costs. Transfer from the ICU to wards involves the exchange of information among ICU and ward staff, often foundation doctors, which has been shown to be fraught with errors. NICE has published guidelines for the transfer of patients from critical care to wards.

Phase one consisted of a prospective audit of patients discharged from a large 30 bed ICU in a tertiary referral centre for compliance with NICE guidelines. Phase two involved a questionnaire to determine how many foundation trainees had been responsible for review of patients discharged from ICU and their experience of transition of care between ICU and ward.

69% of patients discharged from ICU had a formal structured handover with 62% having a written handover plan, easily located within medical notes. 75% of foundation trainees reviewing patients that had been discharged had received a verbal handover. An average time from discharge to ward review of patients' was 3-4 hours. Foundation doctors were concerned about reviewing patients discharged from ICU with the majority finding discharge summaries useful.



### Socioeconomic variations in access to smoking cessation interventions in primary care: insights using the Mosaic classification

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**Background:** Smoking is the leading cause of preventable illness in the UK, with prevalence being highest amongst more deprived social groups. Using Mosaic classification, a novel measure of socioeconomic status, socioeconomic variations in the delivery of smoking cessation interventions in primary care in the UK were explored.

**Methods:** 460,938 smokers registered in The Health Improvement Network database between July 2008 and June 2010 were analysed. Logistic regression was used to calculate the odds of smokers receiving cessation advice/prescription, by Townsend Index of Multiple Deprivation, the 11 Mosaic groups and 61 Mosaic types. Characteristics of smokers were described qualitatively to suggest ways to target those least likely to receive cessation interventions.

**Discussion:** The odds of smokers receiving cessation support increased with increasing Townsend deprivation. Using the Mosaic classification, smokers with uncertain employment, living in social housing, in deprived areas were 35% more likely to receive advice than successful professionals living in desirable areas (OR 1.35; 95% CI 1.20-1.52). Furthermore, smokers in low-income families were 50% more likely to receive a prescription than successful professionals (OR 1.50; 95% CI 1.31-1.73). Smokers less likely to receive interventions were well educated, married with no children, and had broadband access.

**Conclusion:** Wide socioeconomic variations exist in the delivery of smoking cessation interventions in UK primary care. Analysis using Mosaic classification suggests that groups with low intervention rates may be best targeted through broadsheet media and the internet, to increase their awareness of the cessation support available in primary care

### A systematic study of the use of aggressive sales techniques by cosmetic surgery providers in the United Kingdom

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**Background:** Cosmetic surgery is a large and growing industry in the UK. Sir Bruce Keogh, NHS Medical Director, led the review of the regulation of cosmetic interventions in 2012. This included a Call for Evidence involving professional bodies and patient groups. The majority of respondents called for bans on free consultations and time limited promotional deals for cosmetic surgery.

This study aims to examine the extent by which these sales techniques are currently being used by cosmetic surgery providers.

**Methods:** The keywords 'cosmetic surgery UK' were entered in the online search engine google.co.uk. The top 50 websites that provided cosmetic surgery were systematically searched for the following criteria: i) free consultations ii) promotional offers, including discounts and 'multibuy' deals (e.g. "two-for-one") and iii) whether these offers are time limited.

**Results:** Out of 50 cosmetic surgery providers, 29 (58%) offered free consultations. 25 (50%) offered promotional deals, of which 7 (28%) were time limited.

**Conclusions:** This study has demonstrated that there is wide use of aggressive sales techniques by cosmetic surgery providers in the United Kingdom. Tighter government regulations and increase in public awareness of these issues may help in safeguarding patients.

**How does expression of the cancer-associated protein, survivin, regulate motility and adhesion of cultured mammalian cells?**

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Survivin expression is upregulated in human cancers and is involved in metastasis. It is crucial in mitosis and is involved in inhibiting apoptosis, through preventing caspase action. Mutations at threonine 34 can affect the phosphorylation state of survivin, as survivin-T<sub>34A</sub> is constantly unphosphorylated, whereas survivin-T<sub>34E</sub> is constantly phosphorylated. These mutations affect cell behaviours involved in metastasis, such as proliferation and apoptosis inhibition. This project aimed to determine whether these mutations also affected other behaviours involved in metastasis, cell motility and cell adhesion.

Experimental methods included a wound healing assay to measure cell motility, a cell spreading assay to assess cell adhesion, and fluorescence microscopy. Non-transformed fibroblast cells (MRC5 cells) were used.

MRC5 cells expressing survivin-T<sub>34A</sub> showed increased motility compared to survivin-T<sub>34E</sub> expressing cells, which showed reduced motility. Survivin-T<sub>34A</sub> expressing cells showed faster initial adhesion, but reduced adhesion efficiency overall. Survivin-T<sub>34E</sub> expressing cells showed the opposite: slower initial adhesion, but enhanced adhesion efficiency overall. These results indicate that the T34 phosphorylation state is essential in the influence of survivin on cell behaviour related to metastasis. It was suggested that the survivin-T<sub>34A</sub> mutant caused increased activation of  $\alpha_5$  and  $\beta_1$  integrins, causing upregulation of the Akt pathway which led to increased cell motility.

**A potential novel objective measurement of wheeze is not a good measure of severity in bronchiolitis**

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**Background:** In infants with bronchiolitis a clinical score (CS) is used to assess severity and treatment response. It is subjective and does not correlate with measures of pulmonary resistance or clinical outcomes. Acoustic sound analysis has shown potential as an objective monitoring tool. A new handheld device, the Wheezometer®, is designed to assess wheeze at the bedside. We aimed to determine if the Wheezometer® could be used as an objective measure of airway obstruction in bronchiolitis.

**Methods:** Children <1 year with acute bronchiolitis had paired CS and WheezeRate (WR = %respiratory cycle with acoustic wheeze) recordings. Agreement between repeated measurements and correlation between the WR and CS was tested.

**Results:** The study was terminated after N=7 (of planned N=100). Mean age = 9 weeks (range 3 to 40). The Wheezometer **did not detect** clinically relevant 'wheezing' (WR >10%) in any infant despite a range of CS (2 to 7 out of total 12). There is no relationship between WR, as measured by the Wheezometer®, and CS. There was barely adequate intra-observer agreement in repeated CS measurements (Kappa=0.49, 95% confidence intervals 0.18 to 0.79).

**Conclusion:** The Wheezometer® cannot detect clinically significant wheeze in infants with bronchiolitis and therefore is not a useful objective tool in bronchiolitis. While infants with bronchiolitis may have audible wheeze there is a different range of acoustic noise, than true wheeze in older children (notably crackles and low-pitched wheeze), which may not be compatible with the Wheezometer®. Further research is required to develop useful acoustic devices in bronchiolitis

### Role of GPR103 in the regulation of human adrenal steroidogenesis

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QRFP exerts its effects via the G protein-coupled receptor 103 (GPR103) and is recognised for its metabolic role in regulating energy balance and appetite. A high expression of GPR103 in rat adrenal glands has been reported by one study, which suggested it might play a role in the regulation of adrenal function following the observation of aldosterone production after intravenous administration with QRFP (Fukusumi et al., 2003). However, the role of GPR103 in regulating adrenal steroidogenesis in humans has not yet been explored. The present study aimed to investigate the role of GPR103 in human adrenal steroidogenesis by using H295R human adrenocortical cells. By employing Western Blotting, PCR and immunohistochemistry, our study is the first to provide a detailed characterisation of the presence of functional GPR103 receptor in human adrenal glands. We showed that H295R cells expressed both QRFP and GPR103 mRNA and protein. We also demonstrated a direct biological effect of QRFP on human adrenocortical function. Long-term incubation with QRFP over a 24h period increased aldosterone and cortisol production, and this was accompanied by a parallel change in the expression of key steroidogenic genes (StAR, CYP11B1, CYP11B2) involved in human adrenal steroidogenesis. Taken together, our results suggest that QRFP and GPR103 work in an autocrine and/or paracrine manner to regulate adrenal steroidogenesis in humans. This could have important physiological and/or pathophysiological significance that merit further investigation. Considering the metabolic role of QRFP, it may provide a functional link between adrenal malfunction and obesity related disorders.

### Neural Stem Cells: Novel Therapy or Not? Alzheimer's Disease

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**Background:** Alzheimer's Disease (AD) causes multiple neuropathologies (amyloid plaque build-up, neurofibrillary tangle formation and widespread neuronal and synaptic loss). Neural stem cell (NSC) could be a possible therapy for AD treatment yet NSCs need to be multipotent in order to combat the multiple neuropathologies.

**Objectives:** The principle objective of this work was to determine if neural stem cell therapy is a potential treatment for AD.

**Design/ Methodology:** This study contains a literature review regarding developments made in the use of NSC technology to treat AD and clinical trials that have stemmed from this.

**Results:** Discovery of APP and MAPT genes which encode plaque and tangle proteins, respectively, lead to transgenic animal models of AD [1]. Cognitive function improvements have been seen with NSC transplantation in AD animal models [2, 3], however, this does not significantly alter AD pathology [2]. With NSC having no significant effect on AD pathology other factors determine improved cognitive function; animal studies have shown that neurotrophic factors (NFs) improve cognitive function [2, 4, 5]. Two cell based therapy clinical trials in AD have taken place [4, 6]; these focused on neurosurgical implantation of cells that express neurotrophic factors (NFs). The studies show the procedures to be safe with some improvement in cognitive function.

**Conclusion:** Cell based therapy may provide a potential short-term treatment for AD yet further work is needed for longer term therapies. Overall, stem cell and cell based therapy could still be a novel therapy for AD yet it is in its infancy with further research in animal models needed to improve its efficacy.

### A retrospective audit of biologic treatment for patients with psoriasis in a District General Hospital in the United Kingdom

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Due to the cost and uncertain long-term effects of biologic agents used in psoriasis, NICE have published guidance to ensure treatment only takes place if it is cost-effective and safe for the patient.

An audit was undertaken to assess use of biologics in treatment of patients with moderate to severe psoriasis and determine adherence to these NICE guidelines.

We retrospectively reviewed medical notes and electronic discharge summaries for 45 patients currently on biologic treatment for psoriasis. This data was collected on an audit form, the results analysed, conclusions reached and actions agreed following discussion at a departmental audit meeting.

45 (100%) patients were on biologics for psoriasis. At some stage 31 (68.9%) patients had been prescribed Etanercept, 21 (46.7%) patients prescribed Adalimumab, 13 (28.9%) patients prescribed Ustekinumab and 2 (4.4%) patients prescribed Efalizumab before it was withdrawn from the market. First-line agents used; varied from 29 (64.4%) for Etanercept, 9 (20%) for Adalimumab, 6 (13.3%) for Ustekinumab and 1 (2.2%) for Efalizumab. 23 (51.1%) of patients had the severity of their psoriasis documented using an objective severity score.

Treatment with biologics at a District General Hospital was often not in keeping with NICE guidance. Consequently, a pre-assessment proforma was introduced to record; medical history, severity of disease, previous treatments, contraindications, relevant investigations and patient consent. This document could be adapted by other Dermatology Departments to improve and clarify clinical decision making. The utility of this proforma will be assessed with future audits and hopefully establish an improvement in clinical practice

### An Audit of Pre-operative Checks

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**Background:** Pre-operative checks, broadly outlined in local guidance, were performed on each patient the day before surgery by a junior doctor.

I found difficulty in knowing precisely what was required.

#### Experimental Design:

- Determine whether the checks were being performed according to the guidance.
- Create an advice document and checklist.
- Re-audit performance after implementation.

**Methods:** Using the WHO Surgical Safety checklist I selected 9 ideal checks (standards). Records of 39 gynaecological surgery patients were analysed for documentation of these checks. An advice document and checklist were created, circulated and presented at an audit meeting. Following this implementation 50 further patients were audited.

**Results:** Before implementation only 4/9 standards were met in >50% patients and 4 were met in fewer than 20%. Most frequently missed checks were MRSA status, allergies, drug chart completion and VTE assessment. After implementation 6/9 were met in 100% patients. The 3 unmet in 100% of patients were: availability of blood for transfusion (88%) VTE assessment (92%) and allergies (96%).

#### Conclusion

- The advice document and checklist markedly improved documentation of pre-operative checks. This improvement in clinical practice should enhance patient care.
- Junior Doctors indicated:
  - a. the advice document clarified their role.
  - b. the checklist was a useful "to do list" highlighting outstanding checks and a good learning tool.
- It is realistic for further continuous audit to aim for 100% documentation of all checks.
- These tools could be used by all surgical specialties.

### An audit into the efficiency and efficacy of a tertiary level paediatric dysphagia service

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**Background:** There are no national guidelines for paediatric dysphagia. This is the case for many neurodisability services, particularly at a tertiary service level. At Great Ormond Street Hospital, efficacy and efficiency of the dysphagia service has not been previously audited. A 2012 GOSH outpatient survey showed patient and parent satisfaction was lower amongst those with special needs and disabilities.

**Aims:** To develop outcome measures for the dysphagia service and compare clinical practice to these standards.

To identify areas for improvement in the service.

**Method:** The audit was split into two parts: firstly reviewing national outpatient recommendations, interviewing staff, using departmental targets and observing clinics to create audit criteria for the service; secondly collecting the data using a two year retrospective study of clinic reports, letters and appointment records to compare against the criteria. All new patients seen in 2010 and 2011 were included in the audit.

**Results:** The criteria were measured against a 95% target to allow for unavoidable clinical circumstances preventing criteria being met. Of the 15 audit criteria, only 5 had more than a 95% compliance rate. The criteria with the worst compliance rates were recording patient/parent satisfaction and giving written information.

**Conclusions:** The efficacy and efficiency of the service is lower than it should be. This could be because there have not previously been any guidelines to work towards. Improvements in information recording, provision of information and patient administration are needed. This audit provides a baseline and should be repeated yearly to measure improvement in the service

### Patient safety in nasogastric tube placement: an audit pre and post interventions to improve adherence to safety guidance

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Feeding through nasogastric tubes misplaced into the lungs has serious consequences for patient safety. The National Patient Safety Agency (NPSA) alert to reduce this risk recommends using pH testing first line to check NG tube position, with x-ray second line after failure of aspirate. This service evaluation at York Hospital aimed to improve NPSA alert compliance using a behaviour change approach, as part of a Health Innovation and Education Cluster (HIEC) region-wide project.

A retrospective baseline audit of 44 sets of case notes was conducted to assess current practice regarding NG tubes. Questionnaires were completed by multi-disciplinary staff identifying barriers to using pH first line. Two focus groups addressed these barriers. Strategies included using an e-learning package, an NG tubes awareness day, posters/screensavers, new documentation and a radiology system change. This was followed by a re-audit to evaluate the impact of the interventions.

Between baseline and post-intervention, there was a significant increase (14-33%) in use of pH first line for checking tube position ( $\chi^2 = 4.38$ ,  $p < .05$ ), a significant decrease (36-10%) in tubes placed in radiology ( $\chi^2 = 6.64$ ,  $p < .05$ ), but no decrease in the use of x-ray (41-40%;  $p > .05$ ).

The behaviour change methods deployed effectively increased use of pH testing first line for NG tube placement. Documentation also improved. Communication with staff and improving awareness have been beneficial in achieving adherence to the NPSA alert guidance at York Hospital, however the improvement is not as great as at two trusts with similar intervention.



**A Retrospective Audit of the Management of Open Fractures at a Major Trauma Centre**

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The BOA and BAPRAS guideline on the management of open fractures outlines the current standards in the treatment of this orthopaedic emergency. This retrospective audit compares the acute management of open fractures at a major trauma centre to the standards set out in this guideline. We reviewed the notes of open fracture cases in a 6 month period between May and October 2011 and compared the management received by these patients to the clinical guideline, aiming for 100% compliance with standards. 29 cases were eligible. Photography was used in only 10% and none had correct wound coverage. 71% had the affected limb splinted and neurovascular status was examined repeatedly in 79%. Correct antibiotic prophylaxis was given in 53%. 10 cases met criteria for urgent surgery but only half of these were taken theatre within 6 hours. An antibiotic bead pouch or a VAC dressing was not applied to any of the 6 wounds left open for delayed primary closure. Only two cases had plastic surgery input. Surgery was performed by a senior surgeon in 97% and definitive wound closure was achieved within 72 hours in 90%. Overall, current practice is somewhat short of best practice. To implement change we have created a trust guideline for the management of open fractures with an attached audit proforma to be completed prospectively for new open fracture admissions. A teaching session will be organised to update staff. These measures will ensure that the audit cycle is completed and that improvements in practice are sustained.

**HbA1c league tables: Does selection policy encourage foul play to support promotion to the “premier league”?**

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The National Paediatric Diabetes Audit (NPDA) provides a benchmark of performance for Paediatric Diabetic services across the UK. Whether intentional or not, a league table is created comparing units based on their overall mean HbA1c. Although the coordinators suggest submitting the patients most recent HbA1c, this may not necessarily be a universally adopted phenomenon. We examined the effect of selecting patient best, yearly average, and latest HbA1c on our unit's overall mean HbA1c and its impact on our position in the “league”.

All patient HbA1c values were collected for the NPDA periods, January 2010 - March 2011 and January 2011 - March 2012. The patient best, yearly average and latest HbA1c results were used to calculate our unit's mean HbA1c and then compared to regional and national data to assess the impact on our ranking.

For 2010-2011, our mean HbA1c varied significantly from 8.0% using the best HbA1c results to 8.5% with yearly average HbA1c, moving us from 2<sup>nd</sup> to 13<sup>th</sup> in the league. Similarly, for 2011-2012, there were significant variations from 7.8 % to 8.2% and 8.3% using the best, latest and yearly average HbA1c variables.

Therefore, these significant differences in our clinic overall mean HbA1c could see us as champions or candidates for relegation in the league table! The system is potentially open to foul play and tighter regulation of selection policy is required as HbA1c is increasingly used as a performance indicator and in some cases the basis for quality payments.

### Making 'Nil By Mouth' Time for Gastroscopy Patients More Palatable

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**Background:** Fasting prior to endoscopy aims to maximise visualization during the procedure and minimise the risk of aspiration. National guidelines advise patients should be fasted six hours for food, and two hours for clear fluids. The aims of this audit were to introduce measures whereby fasting times met current guidelines, and prevent fasting in excess of these recommendations.

**Method:** Patients included were all on the emergency endoscopy list; data regarding the time patients were made NBM, and the time of the actual procedure was collected and compared. Cycles of data collection were repeated after interventions were made on two surgical wards and one medical ward - these included educating nursing and endoscopy staff, and introducing a revised NBM sign. Currently on our third cycle, whereby further interventions are being made and data is being collected. The PDCA method was used to analyse results.

**Results:** The mean baseline NBM time (prior to intervention) was 22 hours. After the first cycle (with nursing education and an NBM sign), the mean NBM time was 10.2 hours, a 56.6% reduction in NBM time relative to pre-intervention. Nursing staff knowledge of NBM protocol improved from 40% to 60%. The second cycle involved a revised sign and further education; the mean NBM time was 9 hours, a 41% reduction in NBM time relative to the first intervention.

**Conclusion;** NBM timings have been much improved with ongoing staff education, and implementation of a revised sign with clear guidelines.

### Role of CD32b in the internalisation of monoclonal antibodies

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**Background:** Internalisation of type-I anti-CD20 monoclonal antibodies (mAbs) is thought to be one of the underlying mechanisms of treatment resistance in B-cell malignancies as only surface-bound antibody is effective for tumour destruction. Internalisation was shown to correlate with expression of CD32b on Chronic Lymphocytic Leukaemia cells.

**Aims:** Determine whether internalisation of a variety of other mAb is dependent on CD32b and if differences exist among lymphoma subtypes.

**Method:** Internalisation was quantified using a fluorescence quenching flow cytometry assay; firstly with Ramos cell lines (control/CD32b-transfected) then primary clinical samples (Mantle Cell Lymphoma (MCL), Follicular Lymphoma (FL), and Diffuse Large B-cell Lymphoma (DLBCL)). Cells were treated with Alexa-488 conjugated antibodies against CD19, CD20 (both Type-I and-II, of varying isotypes) CD22, CD37, CD38 and MHCII. Anti-CD32b mAb, AT10, was used to block CD32b in clinical samples.

**Results:** Dependence on CD32b for internalisation was demonstrated with cell lines. Clinical samples varied in CD32b expression levels, however, type-I mAbs consistently internalised faster than type-II, agreeing with previous data. Internalisation sometimes did not correlate with CD32b expression in FL; however, the effect of AT10 was largest in high expression samples, potentially suggesting different FL subtypes. Data from other antigens suggest CD19 and CD37 may prove better therapeutic targets as less internalisation occurred in comparison with CD22.

**Conclusion:** Continued investigation of all antigens in different lymphoma groups is needed. The present data may demonstrate the existence of specific FL subtypes more or less susceptible to internalisation. The addition of anti-CD32b mAb may improve treatment of certain lymphomas

**Overcoming barriers to the Ottawa ankle rules in a tertiary UK hospital**

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Ankle sprains account for over 300,000 A&E attendances per year in the UK. Whilst over 80% of ankle injuries reporting to emergency departments (ED) undergo radiography, fewer than 15% have a fracture. The Ottawa ankle rule (OAR) is a validated clinical decision rule for determining whether radiographs are required for acute ankle trauma.

An online survey was distributed to ED clinicians at a tertiary UK hospital to assess knowledge, compliance and barriers to implementation of the OAR. A retrospective audit was then conducted of all ankle x-rays for acute, traumatic ankle injuries in the ED during January 2013. Compliance of the OAR was measured from electronic requests and clinical notes. Strategies for change included education, a proforma, patient leaflets and an OAR electronic ankle order request reminder. A re-audit was then conducted.

Over 90% of ED staff answered they had heard of the Ottawa ankle rules, however, fewer than 15% could state the complete rule. Primary barriers cited to using the Ottawa ankle rules included meeting patient expectations and medico-legal implications of missing a fracture. The audit identified 33% of ankle x-rays were justified using the OARs. Preliminary results of the re-audit have showed a 25% increase in the use of the Ottawa ankle rule by ED staff and a 15% increase in proportion of x-rays showing an ankle fracture.

Knowledge and compliance with the Ottawa ankle rules amongst emergency department providers is poor. Compliance in a tertiary UK hospital has been improved with a multi-strategic approach

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