

## ASGBI abstracts 2015

### Short papers

1. Education and Training (pp. 2–6)
2. Vascular Transplant (pp. 7–11)
3. General Surgery Performance and Safety (pp. 12–16)
4. Lower GI 1 (pp. 17–21)
5. HPB Upper GI Bariatric (pp. 22–26)
6. Breast Endocrine (pp. 27–36)
7. Lower GI 2 (pp. 37–41)
8. Oesophagogastric Cancer Upper GI (pp. 42–46)
9. Colorectal Cancer (pp. 47–51)
10. Basic Science (pp. 52–54)
11. Breast Endocrine Other
12. General Surgery Surgical pathways (pp. 55–59)
13. Day Ambulatory Surgery (pp. 60–64)
14. Lower GI General Surgery (pp. 65–69)
15. Emergency General Surgery (pp. 70–74)
16. Trauma & Emergency Surgery Critical Care (ASGBIATMS) (pp. 75–79)

## Education and Training

### Education and Training 0149

#### Counting surgical Competence: a Curriculum Concordance Analysis

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**Aims:** In 2013, the JCST published guidelines for the award of a CCT in General Surgery citing global operative experience together with other professional credentials. The aim of this study was to determine whether these guidelines were achievable within contemporary MMC UK surgical training.

**Methods:** The CVs and online portfolios of 155 consecutive CCT applicants with certification dates between 1 November 2012 and 12 December 2013 (119 male, 36 female) were analyzed with specific reference to curricular guidelines.

**Results:** No inter-deanery differences emerged related to global guidelines. The median total operative caseload was 1802 (range 783–3764), with 104 applicants (67%) achieving the defined guideline of 1600, which was unrelated to subspecialty preference ( $p=0.133$ ). Median emergency laparotomy caseload was 102 (1–335) with 85 applicants (55%) achieving the guideline of 100, (data excluding, but guideline including, segmental laparotomy and Hartmann's), which was related to subspecialty preference, with GI trainees more likely to exceed the guideline than non-GI counterparts (median 111 vs. 92,  $<0.001$ ). Allowing for this, first quartiles for all indicative procedures matched the guideline numbers with the exception of infra-inguinal bypass. The median number of publications achieved was 7 [0–100, median 4 (0–30) as first author], and median national or international presentations 10 (0–67). The academic guidelines of 3 peer reviewed publications and 3 presentations were achieved by 136 (88%), and 146 (94%) respectively, and requisite courses by 28%.

**Conclusions:** Global operative and academic achievements varied widely with two thirds of applicants achieving elective operative guidelines, and over half achieving the requisite experience in emergency laparotomy. A total of 5% of trainees achieved all the non-operative guidelines. Measures to identify trainees in the lower quartile early within training allied to enhanced simulation resource should be considered to rectify this apparent surgical training experience shortfall.

### Education and Training 0157

#### The Cost of Surgical Care: Trainees' Awareness of the Financial Costs of Healthcare

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**Aims:** Financial pressures in the NHS are placing increasing focus on healthcare costs. This study aims to assess surgical trainees' awareness of the cost of routine healthcare interventions carried out in the NHS.

**Methods:** A self-administered questionnaire was distributed amongst delegates at the 2014 ASiT conference. Participants were asked to state the costs of various routine items including; IV cannula, FBC, CXR, single dose of 1-2 g co-amoxiclav, urinary catheter, one unit blood transfusion, 3–0 PDS suture and the cost of a standard NHS bed per day. Participants were also asked to state how much NHS trusts get paid via the national tariff payment system for the following; primary hip arthroplasty, day-case laparoscopic cholecystectomy, appendicectomy, below-knee amputation, CT abdomen and pelvis, general surgery out-patient clinic appointment, diagnostic colonoscopy. The percentage difference between actual costs and responses were calculated with data further analysed with SPSSv20.

**Results:** 390 responses (response rate 64%). 171 (44%) medical students/foundation doctors, 134 (34%) CSTs and 85 (22%) HSTs. Only

9% of respondents stated correct costs within a 10% error margin with just 19% stating a cost within a 25% error margin. Trainees demonstrated better awareness of costs of routine items compared with treatment tariffs (25% vs. 12% of responses within 25% error margin respectively). Although HSTs felt most knowledgeable regarding the costs of healthcare interventions they request ( $P < 0.001$ ) there was no significant difference between training grade and accuracy of responses. 61% agreed that it is important for trainees to aware of the financial costs of healthcare interventions. 68% of respondents agreed that training should be provided in order to improve understanding of NHS economics.

**Conclusions:** Surgical trainees have limited awareness of the costs of routine healthcare interventions. Specific training should be provided in order to improve understanding of NHS economics and payment systems which may facilitate cost-saving in the NHS.

### Education and Training 0278

#### Using Social Media to Share Surgical Evidence-Based Medicine: A Comparison of two Social Media Platforms

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**Aims:** More than 1.5 billion people use Facebook and Twitter to share information. It is unclear if these free platforms are effective when used to share surgical evidence-based medicine (EBM). The aim of this study was to compare interactions and engagement on Facebook and Twitter when used to share surgical EBM.

**Methods:** EBM content was uploaded simultaneously to the Schoolofsurgery.org Facebook and Twitter sites between January and September 2014. Main outcomes were (1) impression rate (number of post views divided by the number of followers the day the post was uploaded) and (2) engagement rate (number of 'likes', 'shares' or comments on posted content divided by the number of views the uploaded post received). Data was retrieved from Facebook and Twitter.

**Results:** Schoolofsurgery.org Facebook and Twitter users increased from 53,408 to 63,224 and 1,693 to 2,724, respectively. Users on Twitter were predominately male (76% vs. 59%,  $<0.001$ ) and from high-income countries (52% vs. 26%,  $<0.001$ ) compared to those on Facebook. The 1,032 uploaded EBM posts were viewed 8,612,640 times on Facebook and 767,852 times on Twitter. Impression rate was 14.4% vs. 34.1% ( $<0.001$ ) and engagement rate was 0.5% vs. 2.9% ( $<0.001$ ) on Facebook and Twitter, respectively. While the post topics did not affect engagement or impression rate, the engagement rate was significantly higher at the weekends compared to the weekdays on Twitter (2.46%, IQR 1.30–3.93 vs. 1.87%, IQR 1.04–3.21,  $<0.001$ ), but not on Facebook.

**Conclusions:** Social media platforms can be used to effectively share surgical EBM. Twitter appears to be more engaging platform when used for by surgeons to share EBM compared to Facebook.

### Education and Training 0300

#### Has the Bachelor of Surgery left Medical School?

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**Aims:** Undergraduate medical education in the United Kingdom (UK) has recently shifted away from traditional specialties, largely influenced by the GMC's Tomorrow's Doctors. It is emerging that changes in the UK and international curricula are not adequately preparing students for clinical practice. Approximately 80% of Foundation Year doctors undertake a job within a surgical specialty. This study sought to identify whether surgery is adequately taught within UK medical schools.

**Methods:** All 33 UK medical schools and final year medical undergraduates were surveyed as to their curriculum content and perceived preparedness respectively using Likert items.

**Results:** A total of 303 final year medical students responded from 29 medical schools, 89.1% agreed medical school prepared them for practice within medical specialties, contrasted with 68% for surgery. Only 48.5% said they would be confident managing the acute surgical patient.

One third of students said they had received adequate surgical teaching whilst at medical school.

Furthermore, not all medical schools provided training in clinical skills mandated by GMC regulations. Students also felt unprepared to perform basic skills such as suturing.

The mini-STEEM tool proved a valid (Cronbach's Alpha = 0.821) measure of the operating theatre environment. The perceived environment was significantly associated with satisfaction of surgical teaching (< 0.05).

**Conclusions:** UK undergraduates do not receive adequate surgical training. Most medical schools appear not to place much emphasis on surgery, despite many doctors undertaking jobs within surgical specialties. In order to maintain safe practice, medical schools must increase surgical teaching within undergraduate curricula.

## Education and Training 0306

### Inspiring Future Surgeons - The Art of Anatomy

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**Aims:** In surgery, art and science are interdependent and surgeons use their creativity to solve problems. Surgeons and artists both require skills of observation, critical thinking, dexterity and accuracy. Art and anatomy have an enduring relationship that can be traced back to the Renaissance with Da Vinci and Vesalius. Our pilot study aimed to inspire medical students to consider a career in surgery by teaching clinical anatomy using art.

**Methods:** The course consisted of four 2.5-hour sessions. Local surgeons delivered short lectures on clinically relevant anatomy, followed by teaching using dissected specimens. Students had input from a local artist and produced a piece of art demonstrating the anatomy they were studying. Media included body paint, clay and charcoal sketching. Students completed pre- and post-course questionnaires; data were analysed using SPSS 18.0.

**Results:** All students (n = 63) reported that the session was enjoyable and that they would recommend the course to their peers; 94% felt it had improved their knowledge of anatomy and 98% found the session useful. After the course 97% of students intended to use art to learn anatomy, whereas only 56% had used art to study anatomy prior to the course. The number of students who strongly agreed with the statement 'I enjoy anatomy significantly increased from 41% to 60%. Prior to the course 15% of attendees strongly agreed with the statement 'I am considering a career in surgery'; this increased significantly to 41% of students after the session (< 0.05  $\chi^2$  for trend). One student observed: 'understanding the clinical relevance before the (art) session brings the anatomy to life'.

**Conclusions:** Using art in anatomy education is feasible and proved popular. Teaching clinical anatomy using art engages students and may encourage them to consider a career in surgery. Art and anatomy classes are enjoyable and may be used to supplement conventional teaching methods.

## Education and Training 0394

### Affordable simulation using a Fresh Frozen Cadaveric model for a Deanery wide cohort of trainees

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**Aims:** Simulation of surgical procedures is now included in the Intercollegiate Surgical Curriculum Programme (ISCP) as either Strongly Recommended or Desirable for many procedures. Better Training Better Care (BTBC) pilots were a Health Education England (HEE) initiative to maximise learning opportunities in the time available for training. Core trainees (CTs) at a BTBC pilot site were timetabled to attend fresh frozen cadaveric workshops as part of their training which were shown to be affordable and of excellent educational value. The aim of this study was to determine if the model could be expanded and delivered to a Deanery wide cohort of core surgical trainees.

**Methods:** Core Trainees in surgical specialties in the Deanery were timetabled to attend a workshop. Appropriate procedures were performed by CTs, supervised by a Consultant trainer. Workplace Based Assessments (WBAs) were completed on the ISCP as simulated procedures. Feedback was obtained using a questionnaire. The educational value of the workshop was evaluated using a mini surgical theatre educational environmental measure (miniSTEEM).

**Results:** 63 CTs attended over three days and performed 192 operations with WBAs on five cadavers at a cost of £104 per operation. A further 47 procedures were completed without WBAs. Concurrent wetlabs on removed tissue, included tendon repairs, intestinal anastomoses and aortic valve replacement. The fresh frozen cadavers were considered as very similar or similar by 97% of CTs. The miniSTEEM showed the workshop to be an Excellent Educational Experience.

**Conclusions:** Fresh frozen cadavers facilitate high quality simulation of surgical procedures. Careful planning allows optimum use of each cadaver. The costs compare favourably with other less realistic models of simulation. Fresh frozen cadaveric simulation meets the need for simulation in the ISCP and allows trainees to develop key skills transferable to the clinical environment.

## Education and Training 0414

### Pursuing a Career in Surgery: What Can We Do to Encourage Medical Students?

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**Aims:** In recent years there has been a decline in junior doctors opting for a surgical career. A variety of perceived limitations to a surgical career have been described previously and accessing medical students early in their career may prove beneficial. We aimed to ascertain the main factors influencing pre-clinical medical students' career choice.

**Methods:** An online questionnaire was distributed to 122 pre-clinical medical students. Students were asked to rate separately the importance of commonly viewed limitations towards and possible attractants to a career in surgery.

**Results:** There was a 97.5% (119) response rate. The most important factor limiting a surgical career was strong competition ratios. Female students placed greater importance towards family implications (p = 0.0003); students affiliated to a surgical society placed greater importance on career guidance (p = 0.001) and mentorship (p = 0.0004). More males were considering a career in surgery than females (47.2% vs 18.6%) yet equal proportions remain undecided in their career choices (47.2% vs 55.8%). Earlier exposure to a surgical environment and better career guidance were the highest ranked aspects to encourage a surgical career.

**Conclusions:** Strong competition ratios remain an important consideration for medical students perusing a surgical career. Female students view family commitments as a more important issue for a future career, which must be addressed, yet a significant proportion still remain undecided. Those students with a possible early interest in a surgical career feel there is a lack of mentorship and guidance for a potential surgical career. Increased availability of ever

changing competition ratios, mentoring, less than-full time training opportunities, and the presence of male and female role models at all levels should be priorities to attract more students to surgery. Medical school curriculum and the role of surgical societies should be at the forefront of these changes.

## Education and Training 0432

### The Integration of Simulated Surgical Skills Sessions into the Undergraduate Curriculum

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**Aims:** Medical students and foundation doctors often lack the basic surgical skills required to undertake ward procedures or assist in theatre. Skill acquisition is also essential for pursuit of a surgical career and early commitment to specialty is encouraged. This pilot study aimed to improve the basic surgical skills of final year medical students through a low-budget simulated skills session.

**Methods:** A 4 hour skills session was introduced during the 5<sup>th</sup> year surgical placement. Students were taught on low-cost, low-fidelity equipment by surgical trainees and fellows. Skills taught included gowning and gloving, knot tying and suturing. Students completed pre- and post-course questionnaires. A rating scale for each statement was applied from 1 (strongly agree) to 5 (strongly disagree).

**Results:** Data were collected for 50 students. Before the course only 8% students could confidently tie a one-handed reef knot. The course resulted in a significant increase in proportion students confident to perform one-handed reef knots (8% to 90%,  $p=0.0001$   $\ddagger$  2), instrument ties (30% to 92%,  $p=0.0001$   $\ddagger$  2), surgeon's knots (20% to 88%  $p=0.0001$   $\ddagger$  2) and interrupted sutures (50% to 96%,  $p=0.0001$   $\ddagger$  2). The percentage confident to teach these skills in addition to gowning and gloving also increased significantly. 48 students felt the course made them feel more confident about spending time in theatre, 14 students agreed that the course had changed their attitude towards a surgical career and all would recommend it to their peers. One student remarked This should be included as a formal part of the curriculum ... Definitely a worthwhile addition to the syllabus.

**Conclusions:** The integration of a simulated surgical skills session into the MBChB curriculum is feasible, economical and valuable. Simulated sessions are essential aids to skill acquisition, inspiring confidence in medical students and enabling fuller participation in surgical procedures; thereby potentially assisting pursuit of future surgical careers.

## Education and Training 0455

### Rural rotations at core: Rarefied exposure or real experience?

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<sup>1</sup>University Hospital of Wales, Cardiff, United Kingdom

**Aims:** Surgical recruitment challenges in Wales are frequently associated with rotations involving rural District General Hospitals (rDGH), partly because of perceptions regarding the adverse risks associated with distance from individuals' social support networks allied to a fear of potential suboptimal training environments when compared with larger District General and Teaching Hospitals. The aim of this study was to determine the outcomes of core surgical training (CST) rotations involving significant training time in rDGHs with respect to JCST defined curricular requirements.

**Methods:** Online portfolios (ISCP) from 99 Wales CSTs were reviewed related to operative experience, workplace based assessments (WBA), and academic output. Individual (6 month) posts were classified as rDGH or enhanced DGH / Teaching hospitals. Of the 99 CSTs, 19 had completed at least 2 rDGH posts within 2-year rotations and were compared with 80 control CSTs. Primary outcome measure was success at national ST3 selection.

**Results:** Median logbook operative experience was 331 (93–611) operations in the rDGH rotations vs. 340 (64–1020) in controls ( $p=0.555$ ). Median WBA numbers and audits performed were similar at 79 vs. 79 ( $p=0.469$ ), 3 vs. 3 ( $p=0.37700$  respectively). Median presentations to national and international learned societies were fewer in rDGH rotations at 1 (0–5) vs. 2 (0–20,  $p=0.06$ ),

as were median numbers of scientific publications at 0 (0–3) vs. 3 (0–11,  $p=0.217$ ). ST3 appointment was similar at 21.1% vs. 21.3% ( $p=0.985$ ).

**Conclusions:** CSTs should be reassured that progression from rDGH rotations were similar irrespective of specific placement though a non significant lesser academic output was associated with rDGH experience. Such data should help inform future rotational planning.

## Education and Training 0469

### Relative value of rural placements within Higher Surgical Training Programmes

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**Aims:** Rural district general hospitals (rDGH) provide a consultant led service for risk adjusted scheduled and unscheduled surgery, yet despite offering a potentially valuable training environment, adverse perceptions often exist among Higher Surgical Trainees (HST) regarding the suboptimal training opportunities when compared with larger District General (DGH) and Teaching Hospitals (TH). The aim of this study was to determine HST outcomes of rDGH post placements with respect to JCST defined curricular requirements for the award of Certification of Completion of Training (CCT) in a single UK Deanery.

**Methods:** Online portfolios (ISCP) from 59 HSTs were reviewed (386 6-month posts, 78 rDGH) with reference to generic indicative operation target numbers, workplace based assessments (WBA), and academic achievements.

**Results:** Median (range) total operative experience in rDGH placements was comparable with larger DGH and TH [142 (61–236) vs. 137 (17–283),  $p=0.775$ ], though emergency unscheduled surgical experience with regard to laparotomy [6 (0–18) vs. 8 (0–40),  $p=0.002$ ] and Hartmann's procedure [0 (0–5) vs. 1 (0–9)  $p=0.084$ ] was less. In contrast, elective cholecystectomy experience was two fold higher in rDGHs [7(0–60) vs. 3(0–67),  $p=0.001$ ]. WBA completion [12 (0–50) vs. 14 (0–51)  $p=0.028$ ] and academic achievements in the form of numbers of presentations to learned societies and publications were fewer in rDGH posts at 0 (0–8) vs. 0 (0–20,  $p=0.061$ ) and 0 (0–2) vs. 0 (0–9,  $p=0.311$ ) respectively with no significant inter-hospital differences discernable.

**Conclusions:** Rural DGHs appear to provide a bespoke clinical training experience akin to that of larger DG and Teaching hospitals, although the academic training components require focus, HSTs should be reassured in this regard.

## Education and Training 0473

### Reporting Quality of Observational Studies in Plastic Surgery Needs Improvement: A Systematic Review

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<sup>1</sup>Department of Plastic Surgery, Mid Yorkshire Hospitals NHS Trust, <sup>2</sup>University of Southampton, <sup>3</sup>Barts and the London SMD, <sup>4</sup>Brigham and Women's Hospital and Harvard Medical School, United Kingdom

**Aims:** Our objective was to determine the compliance of observational studies in plastic surgery with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement checklist.

**Methods:** All cohort, cross-sectional, and case-control studies published in 5 major plastic surgery journals in 2013 were assessed for their compliance with the STROBE statement.

**Results:** One hundred thirty-six studies were identified initially and 94 met the inclusion criteria. The average STROBE score was 12.4 (range, 2–20.1) with a standard deviation of 3.36. The most frequent reporting deficiencies were not reporting the study design in the title and abstract (30%); describing the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection (24%); describing efforts to address sources of bias (20%); reporting numbers of individuals at each stage of the study (20%); and discussing limitations (40%).

**Conclusions:** The reporting quality of observational studies in Plastic Surgery needs improvement. We suggest ways this could be improved including better education, awareness among all stakeholders, and hardwiring compliance through electronic journal submission systems.

## Education and Training 0578

### Procedure-based assessments (PBA): Are current guidelines for the award of a Certificate of Completion of Training (CCT) in General Surgery (GS) valid?

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**Aims:** CCT guidelines for GS require trainees to undertake 50 cholecystectomies (CC), 20 segmental colectomies (SC) and 5 Hartmann's resections (HR) and submit 3 level 4 PBAs (operate independently, deal with complications) for each procedure to demonstrate competence. This study examines the relationship between operative numbers and the level of competence achieved.

**Methods:** The ISCP portfolios of all GS trainees in our region were examined and the date, assessor and score for relevant PBAs recorded. Cross-referencing against logbooks established the relationship between operative numbers and the competence level achieved.

**Results:** 830 PBAs (74 trainees, ST1-ST8) were assessed. Trainees achieved their first level 4 PBA for CC after 59 (mean) cases although the standard error of the mean ( $\pm 7$ ) confirms significant variability. After 50 CCs 35% of PBAs were scored at level 4, 60% at level 3 and 5% at level 2, only 44% were assessed as level 4 after 100 CCs. 8 trainees had  $\geq 3$  PBA scores of 4, the third being achieved after  $91 \pm 17$  procedures. For SC the first PBA 4 was achieved after  $43 \pm 5$  procedures and the third after  $60 \pm 11$ . After 5 HRs PBA scores were 2 (7%), 3 (44%) and 4 (49%) increasing to 88% at level 4 after 10 cases. 3 level 4 PBAs from different assessors (2 trainees) were achieved after 11 and 27 operations. Finally, marked variation in consecutive scores was often evident.

**Conclusions:** Although many trainees undertook the prescribed number of cases for CCT the majority failed to gain three level 4 assessments at this stage. Thus, these arbitrary targets do not reflect competence and should be abandoned in favour of more objective methods. If the requisite achievement remains three level 4 PBAs for index procedures then greater standardisation of assessment is required to ensure consistency/reproducibility and avoid the marked variation noted in consecutive scores.

## Education and Training 0636

### Interest in a surgical career amongst medical students declines during progress through medical school

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**Aims:** There have been few studies that have analysed the career choice of medical students during progress through training. This study assessed the attitudes towards a career in surgery amongst medical students.

**Methods:** This was a longitudinal 5-year study in which a validated questionnaire, about career intention, was given to first year students in 2009. The same questionnaire was given to the same students each year until graduation in 2014. Changes in response were analysed to determine trends in career choice during progression through medical school. Chi-squared tests were used to compare year groups.

**Results:** Response rates ranged from 76% (Year 3) to 92% (Year 2). 67% of students were women. Amongst first years, 52 (25%) planned to pursue a surgical career. This fell to 14% by the fifth year ( $P=0.007$ ). During the same time period, interest in a medical sub-specialty (7% to 24%,  $<0.001$ ), GP (10% to 22%,  $P=0.001$ ) and anaesthetics (1% to 8%,  $<0.001$ ) all increased, though interest in paediatrics also declined.

Key factors involved included personal experience of surgery (rising from 55% to 83%,  $<0.001$ ). 35% of men planned a surgical career as compared with 12% of women ( $<0.001$ ); this gender gap widened through medical school.

Earning potential was very important to 22% of students who planned a surgical career as compared with 13% of students who did not ( $P=0.007$ ) and the importance of interesting work and academic reputation was also greater in those who wanted to do surgery.

**Conclusions:** Interest in surgery falls during medical school and there are still large gender differences. The specialty is failing to attract the undergraduate medical population which may affect workforce planning and recruitment in the future.

## Education and Training 0802

### A cross sectional survey demonstrating the lack of critical appraisal teaching in the undergraduate curriculum

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**Aims:** Evidence based medicine forms the cornerstone for excellence in clinical practice. The GMC's 'Tomorrow's Doctors' highlights the need for undergraduates to develop their skills in critically appraising medical literature. Our survey investigates the confidence of medical students' and doctors' ability to critique scientific papers and determines whether there is sufficient teaching of critical appraisal at an undergraduate level.

**Methods:** An anonymised questionnaire was distributed to final year medical students from the three medical schools within the West Midlands and to junior doctors and senior trainees within the West Midlands Deanery. Responses regarding confidence levels of appraising scientific papers (scale 1–10, 10 being most confident) were obtained. Data to establish if undergraduates believed they had sufficient teaching on paper critiquing and whether this should form part of the curriculum was also collected.

**Results:** There were 261 responses consisting of 128 medical students, 62 FY1s, 34 SHOs, 38 SpRs and 5 post-CCT fellows. The confidence rating participants gave for understanding methods and results and also for critical appraisal produced a median of 5 in students, house officers and SHOs (range 3–9), 7 in registrars (range 6–9) and 8 in post-CCT fellows (range 7–9). 243 (93%) respondents felt there was inadequate training in research methodology and paper appraisal in the undergraduate curriculum. 255 (98%) participants thought this ought to be integral to the curriculum.

**Conclusions:** In spite of students', doctors' and the GMC's expectations, critical appraisal of scientific papers and the principles of research methodology appear to be neglected in the undergraduate curriculum. This could contribute towards a future lack of confidence amongst all grades of doctors in applying these skills.

## Education and Training 0855

### Clinical Coding: Is It Addressed By The Undergraduate Medical Curriculum?

N. A. Heywood<sup>1</sup>\*, M. Gill

*Northwest Research Collaborative, United Kingdom*

**Aims:** Accuracy of Hospital Episode Statistics and Payment by Results are highly dependent upon data obtained through clinical coding. This is, in turn, reliant on the quality of the medical records. However, through a previous regional audit, we have shown up to 30% of Primary Diagnostic codes and 15% of Primary Procedure codes in acute general surgical admissions are inaccurate. With most clinical documentation carried out by junior doctors, we sought to identify the level of teaching of clinical coding in undergraduate education prior to employment.

**Methods:** The leads for undergraduate education from the 34 UK medical schools were contacted regarding the inclusion of clinical coding in their curriculum.

**Results:** Response was received from 22/34 (65%) medical schools. Only 1/22 (4.5%) of medical schools included coding as formal teaching whilst others had no specific objectives. One stated they had no intention of introducing clinical

coding as a topic, another stated it wasn't a learning outcome and a further response made comment that it wasn't applicable to those students who were to become General Practitioners.

**Conclusions:** Medical Schools are responsible for providing a curriculum to meet the assessments as laid out in GMC Tomorrow's Doctors. This includes keeping accurate, legible and complete clinical records, evaluating epidemiological data and applying principles of health informatics and economics to medical practice. All doctors spend their junior years in a hospital setting where they have responsibility for data, and we suggest that to improve accuracy of clinical data, specific clinical coding objectives should be addressed by the undergraduate curriculum in preparation for the foundation programme.

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**Results:** Response was received from 22/34 (65%) medical schools. Only 1/22 (4.5%) of medical schools included coding as formal teaching whilst others had no specific objectives. One stated they had no intention of introducing clinical coding as a topic, another stated it wasn't a learning outcome and a further response made comment that it wasn't applicable to those students who were to become General Practitioners.

**Conclusions:** Medical Schools are responsible for providing a curriculum to meet the assessments as laid out in GMC Tomorrow's Doctors. This includes keeping accurate, legible and complete clinical records, evaluating

epidemiological data and applying principles of health informatics and economics to medical practice. All doctors spend their junior years in a hospital setting where they have responsibility for data, and we suggest that to improve accuracy of clinical data, specific clinical coding objectives should be addressed by the undergraduate curriculum in preparation for the foundation programme.

## Education and Training 0988

### The PARE project: Optimising surgical care through emerging technology

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**Aims:** Excellent surgical care requires optimal management of medications. Replacement of paper prescriptions with electronic systems is recommended to reduce medication errors but few effective technologies exist to deliver this change. Near Field Communications (NFC) is an emerging technology allowing data transfer between mobile devices. The Prescription Administration Review with Electronics Project aimed to design an NFC based medication system for simulated teaching and clinical practice. We aimed to determine NFC use reduced medication errors while providing innovative training.

**Methods:** A system using electronic tablets and NFC tags to replace paper prescriptions was designed. It allowed medication, prescription and review tasks to be conducted by various healthcare disciplines. Student healthcare providers were invited to conduct a range of medication management tasks on a simulated ward. Errors produced using the PARE system were compared with error produced with use of the traditional paper system.

**Results:** A significant difference was seen between median prescribing errors and mean administration errors committed using the PARE system and the paper system (4.5 versus 0.18, <0.05 and 2.3 versus 0.8, <0.05). User responded positively to the PARE system with high levels of objectively rated satisfaction. 95% of user recommended its use in clinical practice with 87% requesting its use in clinical education.

**Conclusions:** This emerging technology can be incorporated into training to produce an innovative educational tool. We anticipate developing this system for use in the clinical environment to deliver optimal surgical care.

## Vascular Transplant

### Minimally Invasive Surgery 0200

#### Outcomes of persistent intraoperative type 1a endoleak following standard endovascular aneurysm repair

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**Aims:** To analyse outcomes for patients with persistent intraoperative type 1a endoleaks following standard endovascular aneurysm repair (EVAR).

**Methods:** The study group was identified from a consecutive cohort of 209 patients undergoing EVAR in a tertiary UK centre over a two-year period. A retrospective analysis of data prospectively collected on departmental computerised databases was undertaken. Primary outcome parameters were defined freedom from type 1a endoleak, EVAR-related re-intervention, aneurysm rupture and aneurysm-related mortality.

**Results:** Forty-four patients (21%) were identified as having a type 1a endoleak on completion angiogram. Thirty-three of them (75%) had a persistent endoleak after intraoperative adjunctive procedures, including repeated balloon moulding, aortic cuff extension and Palmaz stent deployment. Of the eleven patients (25%) who successfully had their endoleak abolished intraoperatively, there were no recurrence of type 1a endoleak or secondary intervention to treat type 1a endoleak during a median follow-up period of 27 months. Of the 33 patients with persistent endoleak, 31 (94%) demonstrated resolution of the endoleak on first surveillance computed tomography angiography (CTA). One patient was lost to follow-up. Another patient had successful embolization of the endoleak using Onyx eight days after the initial procedure; no type 1a endoleak was identified following this on any surveillance imaging and the patient remains alive 28 months later with a stable aneurysm size. In the rest of the patients, no recurrence of the endoleak in any subsequent imaging was noticed and no secondary intervention was required during follow up. No aneurysm-related death occurred and 91% of the patients had a stable/shrinking aneurysm.

**Conclusions:** Despite adjunctive intra-operative manoeuvres, persistent type 1a endoleaks can be relatively common. Our study indicates that they may be observed in selected patients. Further research is required to investigate the natural course and management of type 1a endoleaks identified intra-operatively.

### Vascular and Transplant 0283

#### Evaluation Of Living Kidney Donors, Is The Split Function Isotope Test Useful?

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**Aims:** The aim was to investigate the role of isotope scanning in the decision making process in Live Donor Kidney Transplantation (LDKT) which is the gold standard treatment for end stage renal failure. BTS guidelines stipulate that measurement of estimated glomerular filtration rate (eGFR) must be assessed prior to donation. CT angiography, followed by isotope scanning are performed if there is a > 2 cm size difference between the kidneys to assess anatomy and differential function.

**Methods:** Retrospective analysis of the CT angiogram and isotopic GFR split function tests of 119 donors (Jan 2012–Dec 2013) at a single centre was performed.

**Results:** The mean age was 49 yrs, 54.6% female, median isotope GFR 90 mls/min/1.73 m<sup>2</sup> (range 64–116). CT angiography showed the median size of left and right kidneys were 10.8 cm (range 8.4 cm–13.5 cm) and 10.7 cm (range 8.4 cm–13.4 cm) respectively. The median split function was 50% bilaterally (range 41–59%). There was a significant correlation of kidney size with split function  $r = 0.3$  ( $p < 0.0001$ ) in the left kidney but a weaker correlation with

the size of the right kidney  $r = 0.15$  ( $p = 0.05$ ). Seven cases demonstrated a > 10% difference in split function, none of these cases had a size discrepancy > 2 cm. Of 119 donors, only one had > 2 cm size difference on CT angiogram (L9cm, R11cm), but the split function was < 10% different. Only one donor who required split function testing according to the guidelines. Only 5.9% ( $n = 7$ ) had differences in function of > 10% indicating that few donors fall into this category.

**Conclusions:** The results of this study confirm reports that a CT angiogram, which provides anatomical information as well as size, can be used to evaluate and predict the function in the majority of living donors without the isotope GFR split function test potentially generating both temporal and financial savings.

### Vascular and Transplant 0368

#### Outcomes following thromboembolism in patients with malignancy

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**Aims:** Acute limb ischaemia (ALI) can have many predisposing causes, including underlying malignancy, and it has been suggested that ALI in this setting is a preterminal event. This study compared limb loss and survival in patients with and without co-existing cancer who underwent thromboembolism for acute limb ischaemia.

**Methods:** All patients undergoing surgical thromboembolism for ALI over a four year period were identified by retrospective review of theatre logbooks. Case note review was carried out to identify the underlying cause of ischaemia. Patients with malignancy were compared to those without, in terms of limb salvage, reoperation and survival.

**Results:** One hundred and sixty eight patients (43% male) underwent 186 thromboembolisms for acute limb ischaemia. Fourteen patients had two operations, and two had three procedures. The lower limb was operated on in 132 cases, and the upper in the remainder. 27 patients with a diagnosis of malignancy underwent 34 thromboembolisms. Malignancy was thought to be the main underlying cause of ischaemia in 24 of these patients, 4 of whom had co-existing atrial fibrillation. Fifteen patients had metastatic disease, and in 2 others malignancy was locally advanced.

Following thromboembolism, 5 of 27 patients with malignancy underwent amputation, compared to 13 of 141 patients without (18% vs 9%,  $p = 0.17$ ). 30 day reoperation rates were 26% in cancer patients vs 15% ( $p = 0.17$ ). Median survival from first embolic event in those patients with malignancy was 143 days compared to 1168 days without ( $< 0.0001$ ).

**Conclusions:** Survival following thromboembolism is significantly shorter in patients with malignancy than in those without. However, even in patients with cancer and ALI, median survival is over 4 months, and therefore these patients should still be considered for thromboembolism.

### Vascular and Transplant 0459

#### Does cardiac risk quantification have a role in assessment and stratification for Pancreas Transplantation?

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**Aims:** Pancreas transplantation (PT) is the gold-standard treatment for complicated insulin dependent diabetes mellitus (IDDM). Perceptions of high peri-operative cardiac risk persist, resulting in clinician reticence to promote the procedure. These currently mandate exhaustive cardiac investigations prior to listing. However, the validity of this approach is not objectively verified and requires further examination.

**Methods:** Retrospective analysis was made of patients undergoing PT in a single centre between January 2001 and March 2014, examining cardiac assessment and correlated to transplant outcomes. Patients were categorised according to myocardial perfusion scan (MPS) into normal perfusion (NP), reversible ischaemia (RI) and permanent ischaemia (PI) groups. Primary endpoints were cardiac death, patient and graft survival. Secondary endpoints were hospital length of stay (HLoS), reoperations and complications.

**Results:** 314 PTs were performed with 152 MPS results available. (60.1% male; mean age 43.8, 82.9% SPK, 12% PAK, 5.1% PTA). 109 (71.7%) MPS showed NP, 24 (15.8%) RI and 12 (7.9%) PI. There was no difference in graft and patient survival between groups ( $p=0.31$ , 0.33 (log rank test)). No significant difference was seen for HLoS (NP: 32.7; RI: 53.3 PI: 35.0), mean reoperation number (NP: 0.8, RI: 0.8, PI: 1.0) or complications (NP: 2.4, RI: 1.0, PI: 1.4) ( $p=0.45$ , 0.12, 0.89 (ANOVA)).

Angiography was performed in 11.1%, 100% and 83.3% of patients in NP, RI and PI groups respectively since 2011 with no subsequent revascularisations as a result of investigations. Of patients with available MPS results, cardiac causes of death accounted for 6.5% ( $n=2$ ; NP: 1, RI: 1) of 31 deaths to date (median follow-up 1224 days (IQR = 2230)).

**Conclusions:** MPS poorly stratifies outcome prediction for cardiovascular mortality. Angiography appears unnecessary, ultimately resulting in a delay to listing. Post-operative cardiac mortality is minimal compared to waiting list deaths, suggesting a requirement for expedited workup.

## Vascular and Transplant 0703

### Repeated salvage of thrombosed AV grafts continues to improve secondary patency

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**Aims:** Primary patency rates of AV dialysis access grafts can be variable, and there is a role for regular surveillance, surgical intervention or angioplasty to improve primary-assisted patency. We examined the outcome of repeated surgical salvage on the secondary patency (overall lifespan) of thrombosed dialysis access grafts.

**Methods:** A prospectively-maintained Excel database was produced which incorporated all patients with functional, in situ dialysis access grafts, and all new grafts in a 4-year period (1st April 2010 until 1st April 2014). All patients were followed-up either until graft failure, death, or the end of the study period. Data were imported from RenalPLUS<sup>®</sup> software (used for all encounters with renal patients) on sex, diagnosis, co-morbidities, graft material and anatomical location, primary patency, and for each subsequent endovascular or surgical intervention. The main outcome was secondary patency, with primary-assisted patencies calculated where appropriate. Kaplan-Meier survival analysis was used to assess secondary patency rates, and paired t-test to assess significance of additional patency after primary patency.

**Results:** 72 patients had complete data for inclusion in the study. Mean primary patency was 336 days. 43 patients required a salvage intervention, conveying a mean benefit of 177 additional days' patency ( $<0.0001$ ). Of those who did not undergo any intervention: 7 had functional grafts, 3 underwent renal transplantation prior to access graft failure, 7 died with functional grafts and 12 grafts failed primarily, requiring new access for dialysis. The mean number of interventions required to maintain secondary patency was 2.15, although the mean 'additional patency' gained with every intervention following the first salvage was 116 days ( $<0.0001$ ). Mean secondary patency was 529 days.

**Conclusions:** Our experiences qualify the benefit of repeated salvage of dialysis access grafts. Significant benefits in patent access were obtained even with multiple interventions. This limits the need for central venous line access for dialysis and prolongs the lifespan of fistula access.

## Vascular and Transplant 0747

### Aortic diameter in screening for aortic aneurysm. When is normal, normal?

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**Aims:** Aneurysm screening programs have been successful in reducing associated mortality. In our region, a population screening program has been in place since 2001. The life expectancy of 65-year-old men in Scotland has increased by 2.14 years from 2001–2012 with 52.3% of men expecting to reach their 82nd birthday. A single screening scan at age 65 may not be sufficient to identify men who would benefit from elective repair of abdominal aortic aneurysm. The outcome for men aged 65, with aortic diameter 25–29 mm, in our program was examined.

**Methods:** Between 2001 and 2012, 224 men with aortic diameter 25–29 mm were identified from the database. Scottish Care Information Store and the national PACS system were interrogated to identify deaths in this cohort, with cause of death, and cases who had aortic imaging for whatever reason after the screening scan. Where formal report of aortic diameter was absent, measurements were made from available images.

**Results:** Median follow-up was 6.6 years (0.3–13.5) and 47 men had died. None of the 4 deaths associated with aortic pathology would have been identified with further scanning or benefited from aneurysm repair. Subsequent imaging was available for 55 cases (median interval 5.7 years (0.5–11.9)). 34 cases (62%) had aortic diameter  $>29$  mm. One of these had undergone aneurysm repair before death from an unrelated cause. Twenty men with aortic diameter  $>29$  mm are still alive, of whom 11 are not under surveillance.

**Conclusions:** Of men who had aortic diameter below the threshold for surveillance scanning, at median followup of 6 years 62% of those reimaged had an aneurysm. Over half of these were not under surveillance. Given increasing life expectancy, this data provides further evidence that men with aortic diameter 25–29 mm at screening merit repeat imaging to identify the cohort of men with progressive aneurysmal disease who may benefit from later elective repair.

## Vascular and Transplant 0752

### Effects of Endothelin receptor antagonism in an experimental model of renal transplantation.

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**Aims:** Uncontrolled Donation after Circulatory Death (uDCD) donors provide a large potential source of kidneys but there is a reluctance to use them due to prolonged warm ischaemic times and associated higher rates of delayed graft function & primary non-function. Endothelin-1 is a major contributor to ischaemic injury through its vasoconstrictive and proinflammatory effects. This study aimed to investigate the benefit of endothelin receptor blockade in an experimental model of uDCD transplantation.

**Methods:** Porcine kidneys underwent 60 minutes warm ischaemia and 2 hours cold ischaemia followed by 3 hours of reperfusion with autologous blood without (control,  $n=6$ ) and with ( $n=6$ ) 500  $\mu$ g BQ-123, a selective ET A endothelin receptor antagonist [Sigma-Aldrich<sup>®</sup>]. Perfusion parameters were recorded continuously and blood, serum, urine and tissue samples taken at fixed intervals to analyse markers of renal function, injury and inflammation.

**Results:** Renal blood flow was significantly higher in the experimental group at 15–30 minutes of reperfusion (29.6–37.7 vs. 13.1–18.2 ml/min/100 g,  $p=0.02$ ), after which, although higher throughout, statistical significance was lost.

Urine output, creatinine clearance and oxygen consumption were also higher in the experimental group throughout reperfusion but statistical significance was only seen in the 1st hour urine output (83 vs. 32 ml/hr,  $p=0.01$ ).

Urinary Neutrophil Gelatinase-Associated Lipocalin (NGAL) levels were not different between the groups ( $p=0.18$ ). Urinary endothelin-1 was significantly lower in the experimental group (7.3 vs. 19.4 pg/ml,  $p=0.02$ ).

There was no difference in levels of urinary Interleukin-6 and Tumour Necrosis Factor- $\alpha$  between the groups ( $p=0.27$  and 0.21 respectively).

**Conclusions:** Kidneys can recover from warm ischaemic injury. BQ-123 appeared to improve perfusion and function initially but did not have a sustained effect or significant overall benefit. Lower endothelin-1 levels suggest reduced tubular injury. Future work may involve assessment using non-selective endothelin receptor blockers.

## Vascular and Transplant 0776

### Reduced serum Selenium: a molecular risk factor for abdominal aortic aneurismal disease?

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**Aims:** Abdominal aortic aneurysm (AAA) is a common condition present in approximately 4% of the male UK males over 65. Studies show levels of several heavy metals including Selenium (Se) may affect both aneurysm formation and growth. The aim of this study was to look at Se levels relating to AAA size.

**Methods:** Males undergoing AAA screening underwent a health and medication questionnaire prior to Duplex ultrasonography (USS) to assess AAA size. Measurement of serum selenium concentration was performed. Data was analysed using a one-way analysis of variance and post hoc Bonferroni-corrected independent samples t-tests.

**Results:** 73 patients were allocated to 3 groups. The control group: AAA (<3 cm) presented with a Selenium concentration of 0.93µmol/L (mean)  $\pm$  0.15(SD). By comparison Selenium concentrations were lower in patients with AAA 3–4.4 cm 0.78µmol/L ( $\pm$  0.16) ( $p < 0.05$ ), and AAA 4.5–5.4 cm 0.78µmol/L ( $\pm$  0.19) ( $p < 0.05$ ). An inverse relationship was observed between serum Selenium concentration and AAA diameter ( $r = -0.56$ ,  $P < 0.05$ , pooled data).

**Conclusions:** Our findings support the concept that depressed serum Selenium may prove a molecular biomarker with the potential to 'track' patients potentially vulnerable to aneurismal disease.

## Vascular and Transplant 0788

### Identifying factors which may predict futility of liver transplantation in a UK population

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**Aims:** The King's College criteria are currently used in the UK to identify patients at increased risk of death secondary to acute liver failure (ALF) and therefore as a means to list patients for liver transplantation. However, with the increasing demands for donated organs, currently no criteria exist to identify those patients in whom transplantation is futile. We aimed to investigate factors which can predict the futility of liver transplantation for ALF and identify possible 'de-listing' criteria.

**Methods:** A retrospective analysis of the UK Transplant Registry was performed (1 January 2001–31 December 2011) for all patients receiving a liver transplant for ALF. All re-transplantations were excluded from analysis. Logistic regression was used to identify factors predicting futility, defined as patient death within 30 days of transplantation. Odds ratios (OR) were then calculated for factors demonstrating significant coefficients.

**Results:** Of 725 transplants performed for ALF, 88 recipients (12.1%) died within 30 days of transplantation. A pre-operative haemoglobin  $\geq 8$  g/dL halved the risk of futility (OR 0.34, 95% CI 0.21–0.57,  $p < 0.001$ ) while sepsis (2.13, 1.04–4.11,  $P = 0.029$ ) also predicted futility. In addition, the presence of ventilatory support (2.10, 1.23–3.76,  $P = 0.008$ ) and renal replacement therapy (1.79, 1.31–2.89,  $P = 0.014$ ) increased the risk of patient death within 30 days. Recipient and donor age, type of sepsis or other biochemical markers had no effect on futility.

**Conclusions:** In a large national population-based retrospective cohort study pre-operative haemoglobin concentration, sepsis, presence of ventilatory support and renal replacement therapy predict patient death within 30 days of transplantation. Further analysis with a prospective cohort of patients may help

to develop a scoring system able to identify those patients where transplantation is futile.

## Audit and Outcomes Research 0804

### Acute Kidney Injury in Vascular Patients: Risk Factors, Outcomes and Preventability

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**Aims:** Acute Kidney Injury (AKI) is more recognized and associated with increased morbidity and mortality. Its aetiology is multifactorial, however, it is preventable and severity can be reduced and thereby improve patient care. The aim of this study was to determine the incidence, risk factors, preventability and outcomes of AKI in vascular patients.

**Methods:** Demographic data, risk factors and care provided to vascular patients were prospectively recorded over an 8 week period in a regional vascular unit. Baseline, admission and peak creatinine were recorded from an electronic database. AKI was defined according to Kidney Disease Improving Global Outcomes (KDIGO) criteria. Patients who developed AKI were compared to those without to identify associations. Outcomes assessed were length of stay, resolution of AKI, need for renal replacement therapy and mortality. Factors known to prevent or reduce the severity of AKI were assessed: presence of a fluid balance chart, discontinuation of nephrotoxic drugs and delays in recognition of abnormal blood results.

**Results:** 112 patients were identified. The overall incidence of AKI was 9.8% ( $n = 11$ ). Risk factors identified for AKI were emergency presentation (63.6 vs 27.7%), sepsis (36 vs 4%) and hypotension (73 vs 1%). Patients with AKI had a longer length of stay (14 vs 5 days). 90% ( $n = 10$ ) of patients had complete resolution of their AKI, 0% required renal replacement therapy and 10% ( $n = 1$ ) of patients died. 80% ( $n = 8$ ) of patients had no fluid balance chart, 27% ( $n = 3$ ) had a delay in recognition of abnormal blood results and 50% ( $n = 1$ ) had discontinuation of nephrotoxic drugs.

**Conclusions:** The incidence of AKI could be reduced. Risk factors identified could be used to stratify and identify vascular patients at increased risk for AKI. Education of staff about early recognition, preventability and optimal management could lead to reduce incidence and improve patient care by reducing morbidity and mortality.

## Audit and Outcomes Research 0825

### Is it Possible to Quantify the Change in Service Demand for Aortic Surgery Following the Centralisation Process: an NVD-Based Predictive Model

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**Aims:** The centralisation of aortic aneurysm surgery centres has created challenges through limited availability of key resources. This study aims to compare changes in aortic surgery workload between 2008–2010 and 2010–2012 using data from the National Vascular Database (NVD).

**Methods:** Data from the NVD for each Trust was compared between two time frames. Three models were used to provide predictive model: ANOVA analysis, A Wilcoxon Rank-Sum Test and regression coefficient estimation. Multiple regression analysis was used to build a predictive model to estimate changes in workload. Actual vs. predicted workload was tested, and standardized residual values analysed.

**Results:** In the second period, 1117 more open and 3916 more EVAR procedures were performed. The average of submitted procedures rose by 52 cases in the second period. Average mortality rate fell by 5% (open) and 0.1% (EVAR). Wilcoxon Rank-Sum Test demonstrated a significant increase ( $< 0.005$ ) in the overall workload for all relevant Trusts. Based on this analysis, a prediction equation was devised: where  $A = 34.75$  and  $B = 1.21$ .

**Conclusions:** For each centre, workload increased by 1.21 times that of pre-centralisation. Vascular service planning should consider this and match capacity (theater sessions, secretarial support, and staff) accordingly.

## Audit and Outcomes Research 0858

### How can surgeons monitor themselves better: validating performance of CUSUM (SPRT) real-time monitoring methods using anonymised UK national vascular database

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**Aims:** Traditional audits are unable to provide short feedback loops to quickly identify underperforming surgical units. We aim to assess reliability and accuracy of continuous monitoring of vascular outcomes using CUSUM.

**Methods:** Cumulative mortality, funnel plot and CUSUM (SPRT) were applied to the National Vascular Database (NVD) and performances compared. In-hospital mortality for 140 centres (1995–2011) following elective abdominal aneurysm repair were compared. Data was adjusted for case-mix. Doubling of odds ratios (OR) were considered a proxy for significant deviation from the accepted surgical failure rate from national mortality rates (p). Control limits were approximated using simulation, Markov chain and fractional polynomial techniques. Average run length was used as a performance measure.

**Results:** Compared to audit, CUSUM has significant sensitivity to a unit's outlier status, with an average of 0.89 alerts (no outlier status) to 23 alerts (outlier status). For best CUSUM performance, values of OR = 3 and p = 3 correlated with CUSUM sensitivity of 80%, specificity of 80% and positive predictive value of 78%. Fractional polynomial technique and CUSUM simulations correlated well to real-time NVD data analysis.

**Conclusions:** CUSUM techniques can be optimised to detect outliers in real-time, and adjusted for case-mix to ensure a 'level playing field' for all units.

## Vascular and Transplant 0862

### The Highland Aneurysm Screening Programme

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**Aims:** The Highland Aneurysm Screening Programme (HASP) ran from 2001 until national screening in 2012. Here we review the results of the completed HASP.

**Methods:** A retrospective review of a prospectively maintained database. Electronic patient records were reviewed. Mathematical modelling was carried out with relation to aneurysm growth rates.

**Results:** 21,635/24,594(88%) of men offered screening attended. On initial scanning 706 men had an aneurysm (3.2%). 63 were > 54 mm on index scan (0.29%). Another 215 men(4.3%) had an aorta measuring 25–29 mm. The average aortic diameter increased with age from a median of 18 mm at 65 years to 19 mm at 70 years. There was no significant change in median aortic diameter over the period of the programme. 2.8% (138/4976) of 65-year-old men had an aorta > 30 mm on their index scan of whom 11 (0.22%) had an aorta > 55 mm. 286 men were considered for operative management. 235 underwent elective intervention (204 open, 31 endovascular), and 23 non-elective open surgery (6 ruptured, 17 symptomatic). Median age at operation was 73.4 years. 28 patients were deemed unfit for surgery. In-hospital mortality following elective repair was 1.7% (4/235) and 4.3% (1/23) following non-elective repair. Follow-up extends to 13 years. Median survival is 11.7 years in the operative group and 3.3 years in the unfit group. There was no significant difference in survival for acute versus elective patients.

Analysis of the growth rate of aneurysms was performed on 600 men who underwent >1 scan. The best relationship between aneurysm diameter was quadratic with diameter equal to  $38.27 + 1.56t + 0.12t^2 - 0.28d$ , where t = time (years) and d = deprivation decile. From this equation, growth rate was linear and was determined as  $[dD/dt = 1.56 + 0.25t \text{ mm/yr}]$ . There was no significant effect of age, initial aortic diameter, rurality or deprivation upon aneurysm growth rate.

**Conclusions:** The HASP was a large, successful screening programme that provided valuable information as to aneurysm morphology and behaviour as well as patient outcomes.

## Patient Safety 0901

### Assessment of endovascular surgery teams is feasible and reliable using a structured rating scale: Endo-OTAS

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**Aims:** We have previously shown that higher rates of errors occur during endovascular procedures as compared with open vascular surgery. Human factors play a significant role in patient safety: minimising risk of errors relies on proficient multidisciplinary teamwork. Endo-OTAS (Endovascular Observational Teamwork Assessment for Surgery) is a novel assessment tool developed specifically to rate teamwork quality during endovascular procedures. The aim of this study was to investigate the feasibility and inter-rater reliability of Endo-OTAS.

**Methods:** Four feasibility domains of Endo-OTAS were analysed using a 36-statement questionnaire with 5-point Likert scale, administered to 32 vascular trainees and consultants from UK institutions. Inter-rater reliability was determined by two blinded observers rating five endovascular aneurysm repair procedures with Endo-OTAS over a total of 16.5 hours. Statistical analysis was carried out using Cohen's kappa.

**Results:** Overall, 63.1% of questionnaire responses were rated positively, i.e. 'agree' or 'strongly agree', with 73.7% and 71.6% positive ratings in the usability and acceptability domains respectively. The inter-rater reliability kappa coefficient for case one was 0.576, or 'moderate' agreement. For cases two to five, kappa remained above 0.75 (0.751 to 0.788), or 'good' inter-rater reliability.

**Conclusions:** These findings demonstrate the tool's feasibility of use and high acceptance by theatre staff. The consistently good inter-rater reliability, with a short learning curve, highlights that a high proportion of the same teamwork behaviours are observed by independent observers. Endo-OTAS has good potential to facilitate training and assessment of human factor skills in endovascular teams, with expected reduction in errors and improvements in patient safety.

## Vascular and Transplant 1000

### Dual antiplatelet therapy and bleeding risk after carotid endarterectomy

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**Aims:** Antiplatelet therapy is a risk factor for haematoma formation and bleeding after carotid endarterectomy (CEA). We audited the incidence of these complications in relation to antiplatelet therapy and other risk factors.

**Methods:** We performed a retrospective audit of patients who had a CEA in a DGH over a 6 year period between August 2007 and August 2013. Comparisons were made with a computer generated randomised selection of CEA patients that had no post-operative bleeding (n = 54).

**Results:** There were 484 CEAs performed during this period. Post-operative bleeding or haematoma formation was a complication in 27 (6%) cases; 14 (3%) required a further operation for this complication. A chi-square test showed no statistically significant increased risk of bleeding or haematoma formation when using dual antiplatelet therapy (aspirin and clopidogrel) compared with single antiplatelet therapy (p = 0.46).

Analysis of blood pressure between cohorts using a t-test revealed no statistical significance in pre-operative highest systolic readings ( $152 \pm 21$  vs.  $156 \pm 13$ , p = 0.51). However, there was a statistically significant difference in post-operative systolic blood pressure readings between patients with no post-operative bleeding and those with ( $152 \pm 28$  vs.  $169 \pm 15$ , respectively, p = 0.016). Furthermore, a chi-square test analysing control of intra-operative blood pressure (to be less than 20% higher than induction blood pressure) revealed a statistically significant difference with patients without post-operative bleeding having better control (p ≤ 0.001).

Analysis using a t-test showed no statistically significant difference in units of blood transfused ( $0.31 \pm 0.75$  vs.  $0 \pm 0$ , p = 0.17) or length of hospital stay for patients who developed post-operative bleeding or haematoma formation

compared with those who did not ( $7.8 \pm 9.1$  days vs.  $3.1 \pm 4.3$  days, respectively.  $p = 0.095$ ).

**Conclusions:** Dual antiplatelet therapy over single antiplatelet therapy seems not to increase the risk of bleeding or haematoma formation after CEA. A tight peri-operative control of blood pressure remains to be paramount in preventing post CEA bleeding complications.

## Vascular and Transplant 1007

### The Temporal Evolution of Inflammatory and Diabetes Biomarkers Following Simultaneous Pancreas and Kidney Transplantation

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**Aims:** The temporal evolution of biological markers in sepsis and following major surgery and trauma has been delineated, allowing for their use in the diagnosis, management, surveillance and treatment of diseases.

Patients undergoing simultaneous pancreas and kidney transplantation (SPKT) undergo a significant clinical inflammatory response post-operatively, but the inflammatory marker profile has not been defined, despite the recognised detrimental effect of pro-inflammatory cytokines on pancreas islet cells. This

study therefore aimed to determine the temporal evolution of biomarkers in the peri-operative period following SPKT, and establish a correlation of these biomarkers to clinical outcome post-SPKT.

**Methods:** The temporal patterns of cytokines (interleukin (IL)- 6, 10 and TNF- $\alpha$ ), inflammatory markers (WCC and CRP) and diabetes markers (insulin, C-peptide, glucagon and resistin) were serially measured at 8 distinct time-points in the first 72 hours post-SPKT.

**Results:** 46 patients were recruited to the study (mean age  $42.69 \pm 7.02$ , 26 (56.5%) male, mean BMI  $25.31 \text{ kg/m}^2$  and 37 (80.4%) DBD).

Levels of C-peptide, Insulin and Glucagon raised significantly 30minutes post pancreas perfusion, when compared to pre-perfusion levels and remained elevated for the study period. Importantly, levels of these diabetes markers were significantly inversely related to prolonged CIT. Levels of IL-6 and IL-10 peaked at 30 minutes and six hours post-pancreas perfusion respectively. CRP levels rose rapidly in the peri-operative period and correlated significantly with the Post-Operative Morbidity Survey on days 5, 7 and 10 post-operatively ( $< 0.05$ ).

**Conclusions:** This paper identifies for the first time, that CIT is significantly inversely related to early pancreatic endocrine function and that CRP provides an easily measurable predictor of recipient morbidity post-SPKT.

The findings may have ultimate utility in defining the concept of delayed graft function in pancreas transplantation and provide evidence for the use of anti-inflammatory therapies in the peri-operative period, to minimise islet cell damage and improve long-term graft survival.

## General Surgery Performance and Safety

### General 0036

#### The effectiveness of treatments for ischaemia reperfusion injury during liver resection surgery determined by network meta-analysis

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**Aims:** This network meta-analysis was performed to compare the effectiveness of interventions aiming to decrease ischemia-reperfusion (IR) injury during elective liver resection.

**Methods:** A comprehensive literature search was performed from 1945 until October 2013 to identify randomized controlled trials. A Bayesian network meta-analysis was performed using the Markov chain Monte Carlo method in WinBUGS 1.4 following the guidelines of The National Institute for Health and Clinical Excellence Decision Support Unit. Odds ratios for binary outcomes and mean differences for continuous outcomes were calculated using fixed-effect model or random-effects model according to model-fit.

**Results:** Forty four trials with 2457 participants were included, and were divided into eight classes of active intervention aimed at decreasing IR injury and an inactive control group. There was no significant difference between the different interventions in mortality, quantity of blood transfusion, and Intensive Therapy Unit stay between any pairwise comparisons. Patients treated with ischaemic preconditioning, cardiovascular modulators, and miscellaneous interventions had significantly fewer serious adverse events compared to patients receiving no intervention. Ischaemic preconditioning patients had significantly fewer transfusion proportions and shorter operative time than patients treated with steroids. Ischaemic preconditioning had significantly lower operative blood loss compared to all other interventions and compared to no intervention, and ranked as best treatment for this outcome with a high probability (99.7%). Patients after ischaemic preconditioning had significantly shorter length of hospital stay compared to no intervention. Metaregression based on the number of major resections performed and the number of cirrhotic livers included in trials showed similar results. Sensitivity analysis showed that the drugs sevoflurane (a volatile anaesthetic), verapamil (a calcium channel blocker), and gabexate mesilate (a thrombin inhibitor) produced fewer serious adverse events compared to no intervention.

**Conclusions:** No significant evidence was found to recommend one intervention over another. Ischaemic preconditioning showed promising results for most outcomes.

### Surgical Simulation 0039

#### How Effective is Virtual Reality Simulation for Trainees in Laparoscopic Surgery? : A Systematic Review and Meta-analysis

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**Aims:** Virtual reality (VR) simulation in laparoscopic surgery is a growing field, many studies have been published to determine its effectiveness. This systematic review and meta-analysis aims to evaluate VR simulation in laparoscopic surgery in comparison with other simulation models. This study also aims to determine the level of surgical trainees that benefit the most from VR training.

**Methods:** A systematic literature search was carried out until January 2014. Databases searched were PUBMED, Ovid MEDLINE, Cochrane library's CENTRAL, Clinicaltrials.gov, and Controlled-trials.com. All randomised controlled studies comparing virtual reality training to other models of training or to no training were included. Only studies utilizing objective and validated assessment tools were included. Furthermore, all studies assessing laparoscopic trainees' performance pre and post VR training were included and categorized

by the subjects' expertise level as no laparoscopic experience, novices, or experts. The incremental benefit was then calculated as percentage change from baseline in time and in score.

**Results:** Thirty six randomised controlled trials that compare VR training to other models of training or to no training were included. Sixteen studies were included that measured incremental benefits of trainees pre and post VR intervention. The results of the meta-analysis showed that VR simulation is significantly more effective than video trainers, and at least as good as box trainers. The results also show that novice laparoscopic surgeons benefit the most from VR training when compared to those with no laparoscopic experience.

**Conclusions:** Virtual reality simulation improves operative performance and shortens operative times. This seems to have a stronger impact on novice laparoscopic surgeons in their first years of laparoscopic training. The incorporation of VR training into surgical training curricula is now necessary. Proficiency-based training, under supervision with prompt instructions and feedback has proven to be the most effective way of delivering the VR training.

### Patient Safety 0044

#### An Evaluation Of Surgical Ward Round Performance

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**Aims:** There is significant focus on avoidable harm in healthcare. The use of checklists is increasing as a method of standardising care to ensure minimum standards are maintained and harm avoided. We aimed to compare current surgical departmental ward round performance with criterion from existing published ward round checklists.

**Methods:** Performance parameters for good ward round practice were developed from the published UCLH ward safety checklist and the Caldwell checklist. Covert observation of surgical ward rounds was undertaken by 2 separate medical students, across 3 surgical specialties in Feb 2014.

**Results:** 49 patient consultations from 2 consultant, 4 registrar and 3 house officer led ward rounds were observed. Items that were frequently deficient included routine checking of indwelling line (76%), checking of instigation of VTE prophylaxis measures (57%) and the presence of nursing staff on ward rounds (61%). Items consistently covered well included monitoring of bed side observations (97%), signing and dating note entries (97%) and review of recent investigations (96%).

**Conclusions:** The study relied on subjective recognition of completion of some of the ward round items however a 'lowest common denominator' approach was adopted to give the observed ward round team the benefit of any doubt.

There were many areas of consistent good practice identified. However there were also high levels of deficiency in some aspects of routine care, in particular those associated with a high degree of importance in relation to avoidable harm such as VTE risk reduction and indwelling device infection. The use of a checklist to increase the likelihood that these aspects of inpatient care are routinely considered would seem justified. Further work using quality improvement methodology to implement a workable checklist usable and acceptable to departmental staff is required.

## Audit and Outcomes Research 0073

**Adherence to RCS guidelines and use of word processing improves operation notes and post-operative care; a multi-disciplinary observational study and closed loop audit**T. I. Whitehead-Clarke<sup>1</sup>, N. Varma<sup>2</sup>, A. C. Hadjimichael<sup>3</sup>, F. Gilham<sup>3</sup>, K. O'Brien<sup>3</sup><sup>1</sup>Dartford and Gravesham NHS Trust, <sup>2</sup>Ashford and St Peters NHS Trust, <sup>3</sup>Brighton and Sussex University NHS Trust, United Kingdom**Aims:** To assess the quality of operation notes for elective orthopaedic surgery in line with RCS guidelines, and to assess their quality as a tool for continuity of care by a panel of healthcare professionals.**Methods:** 91 operation notes were audited for adherence to criteria on the Royal College of Surgeons guidelines including consultant name, operation and closure technique. The same operation notes were then assessed for various elements deemed essential for post-operative care such as follow-up and thromboprophylaxis. The same operation notes were finally assessed for legibility and given a 'continuity of care' (CoC) score by a panel of 5 different healthcare workers including junior doctors, physiotherapists and a nurse. Both legibility and CoC were scored from 1–5. Findings were presented at a departmental clinical governance meeting alongside education about guidelines and word processing operation notes. 103 operation notes were re-audited after intervention.**Results:** All Criteria taken from RCS guidelines improved after intervention. Of those factors deemed essential to post-operative care, but not on RCS guidelines, all improved apart from one, which got worse. The average increase in percentage documentation was 12%. Average legibility improved from 3.87 to 4.66, and average CoC score improved from 3.78 to 4.44. The percentage of word-processed operation notes increased from 52% to 81%.**Conclusions:** Operation notes were unsatisfactory before intervention, and improved in almost every criterion after intervention. Adherence to guidelines, legibility and overall satisfaction with operation notes was improved by education about guidelines, and increasing word-processing of operation notes.

## Audit and Outcomes Research 0076

**Pre-Operative Anaemia And Length Of Stay In Elective Primary Arthroplasty Patients**A. Bilkhu<sup>\*</sup>, O. Riaz, G. Sisodia, G. Chakrabarty*Calderdale & Huddersfield NHS Trust, United Kingdom***Aims:** The Network for Advancement of Transfusion Alternatives (NATA) Guidance recommends that undiagnosed anaemia should be detected in pre-operative elective surgical patients by a Hb level within 28 days of the procedure, and be normalised before surgery (Males > 13 g/dL and Females > 12 g/dL). Our aim was to determine the prevalence of pre-operative anaemia amongst patients undergoing elective primary hip and knee arthroplasty within our trust and to assess the impact upon their length of stay.**Methods:** 195 patients underwent elective primary hip and knee arthroplasty in Calderdale & Huddersfield NHS Trust from 1st January to 31st March 2014. These were retrospectively reviewed in order to ascertain their pre-operative Hb and the timing of this test before surgery. Inpatient stay between anaemic and non-anaemic patients was compared and analysed using a Mann Whitney test. Impact upon inpatient stay was analysed using a multivariate regression analysis to adjust for age, gender and type of surgery.**Results:** 195 patients were included. The mean age was 69.4 years. 134 (68.7%) were total knee replacements and 61 (31.3%) were total hip arthroplasties. M:F ratio was 84:111. 188 patients (96%) had their Hb checked within 28 days of surgery, 78 (40%) of these patients were anaemic: 31 males (36.9%) and 47 females (42.3%). The mean inpatient stay was lower for non-anaemic patients compared to anaemic patients: 3.8 (±2.8) days and 5.3 (±2.8) days respectively (<0.05). In the multivariate regression analysis, the model significantly predicted length of stay (R = 0.47, F(190, 4) = 13.47, <0.05) with age and pre-operative Hb reaching significance as independent variables.**Conclusions:** 96% of patients in our trust had their Hb checked within 28 days of arthroplasty surgery. 40% of patients had surgery despite anaemia. This

was associated with an overall longer mean length of stay. Increased compliance with NATA guidelines needs to be enforced for the benefit of reducing inpatient hospital stay.

## Audit and Outcomes Research 0110

**Electronic Patient Record - has its introduction into Greater Glasgow and Clyde improved patient care? A complete 3 cycle audit**A. Harrison<sup>\*</sup>, O. J. Hilmi*Glasgow Royal Infirmary, United Kingdom***Aims:** Background: In Greater Glasgow & Clyde the electronic patient record (EPR) has been introduced into every day clinical use. As a consequence paper records are no longer available in the outpatient setting. EPR is a key deliverables outlined in the Scottish government Health Directorate (SGHD) eHealth Strategy. 1**Aims:** To review the impact of introduction of the EPR as the sole clinical document in outpatient clinic.**Methods:** A 3 cycle audit of Otolaryngology clinics at Glasgow Royal Infirmary held in September over a 3 year period. The same clinics were selected: one general, one otology and one rhinology. The record was retrospectively reviewed for clinical documentation. Outcomes included the completeness of the consultation record, time to letter transcription, time to upload and the accuracy of the record.**Results:** 155 patient records were analysed. There was a significant increase in the time taken for letter transcription between 2011 and 2013 (6 days to 22 to 11.2 days). The presence of a complete and accurate letter fell across the 3 years (98.5% 2011, 95.5% 2012, 84% 2013). In 2013 letters are taking an average of 30 days from clinic to be transcribed and uploaded onto the EPR.**Conclusions:** EPR is not enhancing the availability of information for staff, with 16% of patient records missing clinic letters in September 2013. There has been a significant impact on letter accuracy, availability and time to be transcribed over the 3 year period.

If this is our only method of accessing data then 100% of letters must be available.

## Audit and Outcomes Research 0175

**Analysis of complaints to the division of surgery identifies key areas for improvement in the delivery of patient-centred care**S. Kandola<sup>1\*</sup>, R. Watson<sup>1</sup><sup>1</sup>Royal Blackburn Hospital, East Lancashire Hospitals NHS Trust, United Kingdom**Aims:** Written complaints about patient care are increasing yet there are few published data about who complains and why a complaint is made. Acting on feedback from complaints is an important way of using information coming directly from patients to facilitate the delivery of patient-centred care. Most complaints involve aspects of clinical care and medical staff, demonstrating that this issue directly concerns surgeons and junior doctors. This study aims to examine the circumstances leading to a complaint, identifying areas for improvement.**Methods:** Data were collected from a single NHS trust's database on all complaints to the division of surgery during a 6-month period in 2013 (totalling 114 complaints). Additional information was collated from electronic records. The number of patient episodes during the same time period was extracted from HES data.**Results:** Complaints involved an emergency admission in 35% of cases yet only 4.6% of patient episodes were emergency admissions. Half of complaints were made by the patient themselves with the remainder being made on behalf of the patient by their spouse (11%) or a relative (30%). Where complaints were made on behalf of patient, 30% involved the death of the patient. Delays or cancellations to outpatient appointments or operations accounted for 24% of complaints. General surgery and orthopaedics accounted for 68% of complaints and 41% of patient episodes.

**Conclusions:** This study has identified 3 areas where patients and those close to them have reported a poor experience. Emergency admission to hospital is a risk factor for a complaint and increasing surgeons' awareness of this phenomenon will promote improvements in patient-centred clinical care. When a patient dies during their hospital admission it is clear that improvements in effective communication with relatives are necessary, as shown by relatives' complaints. Reducing delays and cancellations to outpatient appointments and operations is also important to patients.

## Audit and Outcomes Research 0342

### Variations in non-technical skills in emergency and elective theatres- a prospective study

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**Aims:** To assess the non-technical skills of surgeons in emergency versus elective theatre settings. To evaluate the use and compliance to the 'sterile cockpit' during critical situations.

**Methods:** 9 emergency and 8 elective laparoscopic cholecystectomies/laparoscopic appendectomies were observed between Oct and Dec 2014 at a large teaching hospital. The non-technical skills of the primary operator were assessed during the pre-list brief and throughout each operation by a single trained assessor. A standardised NOTSS checklist was used to document positive and negative behaviours against four behavioural categories. Critical periods were noted by the assessor, who recorded whether the 'sterile cockpit' was opened by the operator, if it was recognised by the theatre staff, and what the average noise in the theatre during that time was. A single critical period was selected after confirmation with the operator.

**Results:** Positive behaviours are less prevalent in the emergency setting (Emergency 146/177 opportunities versus elective 154/165 opportunities  $P=0.003$ ). Negative behaviours are more prevalent in the emergency setting (Emergency 15/246 compared with elective 0/216  $P=0.019$ ). Communication is poorer in the emergency setting. There is no significant difference in opening of the sterile field between the elective and emergency settings. Background noise in theatre during sterile field were not significantly different (elective mean 65 dB, emergency 68.3 dB  $P=0.1399$ ).

**Conclusions:** Non-technical skills are poorer in the emergency setting, particularly the theatre brief and communication. The sterile field is rarely opened formally but there is no difference in noise levels between the settings.

## Patient Safety 0361

### Achieving an effective handover is the duty of every doctor - Is general surgical handover in a district general hospital compliant with The Royal College of Surgeons of England guidelines?

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**Aims:** To assess the compliance of general surgical handover in a district general hospital with the Royal College of Surgeons of England guidelines.

**Methods:** Handover documentation over a two week snap-shot was reviewed. Data was collected using an electronic pro-forma for patient location, date of birth, hospital number, age, history, diagnosis, blood results, imaging results, management plan, high risk status, resuscitation status and responsible consultant.

**Results:** 174 patients admitted over a 2 week period were included. No patients had complete documentation in-line with RCS guidelines. Only 41% patients had blood test results documented at handover. 41% of patients had no documented diagnosis at handover. 0 patients had resuscitation status or high-risk status documented at handover. The responsible consultant was documented in only 72% of patients.

**Conclusions:** Current handover documentation is incomplete and does not meet RCS guidelines. The electronic handover pro-forma needs redesigning to ensure all items from RCS guidelines are included, staff need to be educated

on the importance of including such information and regular audit to ensure improved compliance.

## Audit and Outcomes Research 0390

### Speciality referrals in the acute setting - can consensus guidelines help? An audit of medical and surgical admissions from acute specialities.

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**Aims:** Appropriate transfer of care from emergency/acute assessment departments (ED/AAU) to relevant medical and surgical receiving specialties facilitates prompt investigation, definitive management and effective patient care. Following concerns about inappropriate admissions to surgical wards (e.g. surgical patient inappropriately admitted as a medical patient in a medical ward), a consensus Speciality Referral Guideline was developed by emergency, medical and surgical consultants to inform new ED/AAU trainees of the presentations/conditions which would be most appropriate to transfer to medical or general surgery receiving wards.

**Methods:** Acute admissions to medical/surgical wards via the ED/AAU were audited for one week in a large university hospital, using the draft guideline to quantify the issue prior to Speciality Referral Guideline implementation.

**Results:** There were 331 patients admitted to medical receiving and 114 to surgical receiving wards during this period. Using the draft guideline as the referral standard, 15 (4.5%) medical and 11 (9.6%) surgical admissions were considered inappropriate. Common inappropriate admissions were for upper/lower gastrointestinal bleeding, which are managed by medical and surgical specialties respectively; and additionally for patients presenting with exacerbations or issues relating to pre-existing conditions (e.g. inflammatory bowel disease or malignancy).

The Speciality Referral Guideline was revised with this information, disseminated and implemented. Eight weeks following implementation and induction of ED/AAU trainees, a week-long re-audit was undertaken using the Speciality Referral Guideline as the appropriate referral standard with an optimum compliance of  $\geq 95\%$ . This re-audit identified 273 patients admitted to medical wards and 108 to surgical wards, of which only 5 (1.8%) medical admissions and 4 (3.7%) surgical admissions were considered inappropriate.

**Conclusions:** With clearer speciality-specific Referral Guidelines, appropriate referrals and admissions to general surgical (96.3%) and medical (98.2%) receiving specialties increased. This could improve patient care with more prompt investigation and management.

## Audit and Outcomes Research 0406

### Improving the safety of prescription of opioid analgesics at Milton Keynes Hospital

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**Aims:** To educate surgical doctors at Milton Keynes Hospital (MKH) regarding the safe prescription of opioid analgesics, thereby decreasing the incidence of opioid toxicity and potentially preventable adverse effects.

**Methods:** A questionnaire was distributed among 25 doctors to assess the practice of opioid prescription at MKH. Data analysis highlighted lack of awareness regarding the relative potencies of opioids, prevention of adverse effects, and reversal of opioid toxicity. These areas were addressed through educational presentations and distributing a pocket-card. A re-audit was done using the same questionnaire.

**Results:** The initial audit showed that while all doctors were aware of the WHO analgesic ladder, 45% thought that all surgical patients needed opioids for pain relief and only 70% wait for a response from simple analgesics before starting opioids. This improved to 20% and 80% respectively following the interventions.

Moreover, while all doctors have seen patients with opioid-induced constipation, 60% prescribe laxatives alongside opioids. This increased to 88% following the

interventions. Regarding opioid toxicity, 70% were confident in prescribing an antidote. This increased to 80% following the interventions.

Finally, only 10% of doctors were aware of the equianalgesic ladder, and only 40–50% answered questions regarding the relative potencies of opioid analgesics correctly. Following the interventions, the awareness of the equianalgesic ladder increased to 64%. Additionally, 79% of doctors who received the pocket-card answered correctly compared to only 50% of doctors who did not receive the pocket-card.

**Conclusions:** According to the British Pain Society's guidance, opioids should not be used as first line pain therapy and since 80% of patients experience at least one side-effect secondary to opioids, prevention is important. A pocket-card proved to be practical and effective at promoting long-term improvement in opioid prescription at MKH, while educational presentations are indispensable in raising awareness and supporting the message of the pocket-card.

## Audit and Outcomes Research 0423

### Documenting the use of chaperones during intimate patient examinations; adherence to GMC guidelines

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**Aims:** To assess our documentation of the use of chaperones during intimate patient examinations using the GMC Guidelines on Good Medical Practice: 'Intimate examinations and chaperones (2013)'.

**Methods:** Prospective audit of all surgical, urological and gynaecological admissions on surgical assessment unit (SAU) over 1 week. Intimate examinations were defined as those pertaining to examination of the breast, genitalia, digital rectal (DRE) or per vaginal (PV). Case notes reviewed and data collected on a pro-forma.

**Results:** We collected data for 61 patients, M:25, F:36 with an average age of 55y (22y-90y). Breast: 1, genitalia:15, DRE:38 and PV:7. Of 61 patients receiving intimate examinations by doctors, 10 (16.4%) had documentation of a chaperone being used and 9 (14.75%) where the chaperone details were documented. 3 patients (4.9%) had the documentation of a chaperone being declined. 51 patients (83.6%) had no documentation pertaining to the use of or offer of a chaperone.

**Conclusions:** Lack of documentation does not equal absence of chaperone but suggests inadequacy of documentation. Meticulous documentation in this regard needs to be highlighted to all surgical specialties to protect patients from harm and offer medical-legal protection to clinicians from false accusations of impropriety. We intend to re-design our surgical admission pro-forma to include a chaperone box, to educate SAU clinicians and re-audit.

## Surgical Simulation 0435

### Simulation in Undergraduate medical education: Designing a programme to improve medical students' non technical skills.

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**Aims:** A major challenge for medical undergraduates is the application of theoretical knowledge to the management of acutely ill patients. It is essential for medical students to develop appropriate not only clinical but also non technical skills, however opportunities are limited in the undergraduate training and simulation is still underutilised.

We aimed to assess medical students' clinical and non-technical skills according to their exposure to simulation.

**Methods:** Between April 2014 and November 2014 final year medical students who had 8 week placement were exposed to an intense simulation programme (group A). Medical students with 2 week placements received ad-hoc simulation training (group B). Scenarios were regarding common medical emergencies. Students were divided into groups of two or three candidates received the same scenarios and were marked for their clinical and non technical skills. We used the Anesthetics Non Technical Skills (ANTS) scoring system and a scoring system

was designed to assess clinical skills for patient's initial assessment. The marking was conducted by an unbiased simulation fellow. Feedback was also obtained for the simulation sessions. Mann-Whitney U test was used for statistical analysis

**Results:** 65 medical students received simulation sessions and 100% found the scenarios extremely useful. Both groups demonstrated good clinical skills with a median score of 14/16. With regards to the four domains of non technical skills group, A demonstrated better non technical skills. Specifically with regards to Task Management, Situational Awareness and Decision Making group A had acceptable performance (median score 3) whereas group B had poor (median score = 2), (< 0.05). Both groups demonstrated acceptable Team Working skills (median score = 3), (p > 0.05).

**Conclusions:** Providing an intense simulation programme may significantly improve medical students' non technical skills and therefore consideration must be given in implementing a simulation curriculum into the final year of undergraduate training.

## Patient Safety 0493

### The Final Barrier: Error Capture Before Surgery

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**Aims:** Adverse events are always multifactorial. The 'Swiss cheese model' identifies that errors frequently bypass numerous safety barriers before culminating in an adverse event. In surgery the 'final barrier' is the surgical pause and briefing done before each procedure/list. These checks are vital in preventing 'never events' such as wrong site surgery. Surgical briefing and WHO checklists have been mandatory in UK theatres since 2009; nevertheless there were 83 cases of wrong site surgery in the UK 2012–2013. We aimed to evaluate the effectiveness of our briefing and checklist use by analysing errors captured by these processes.

**Methods:** A weekly patient safety huddle is used to co-ordinate the theatre department quality improvement (QI) programme. Captured error data was initially collected to evaluate whether checklist changes were improving outcome. This was ramped-up across the department as per QI methodology and has been imbedded since May 2013.

**Results:** There were a total of 14891 surgical cases over the year from May 2013. There were 31 cases of wrong site/side list errors giving an incidence of 0.21% or 1 in 480 cases. In higher risk specialties (ophthalmology/orthopaedics/urology) this rose to 0.35% or 1 in 286 cases. 301 patients (2.02%) did not have their allergies listed and 10.45% of the diabetic population were not listed as such (108 patients). Other miscellaneous errors can be seen in the table below.

**Conclusions:** This is the first UK data to examine error capture during surgical briefing and checklist procedures. Locally it is motivating theatre teams and has identified up-stream processes which require strengthening. It raises national questions - what is the incidence of list errors in UK hospitals? What strategies reduce them? How do we quality assure surgical briefing and checklist use?

## Audit and Outcomes Research 0509

### Does the use of a standardised clerking proforma for acute general surgery admissions improve the quality of documentation? A prospective two-cycle audit

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**Aims:** The surgical clerking is one of the most important documents in a patient's clinical notes, providing key information on the presenting problems, relevant investigations, initial impression and management plan. The Royal College of Surgeons have endorsed a list of standards to be adhered to in clinical notes. The aim of this audit was to assess the impact of the introduction of a standardised surgical clerking proforma in a district general hospital on the quality of documentation of the initial clerking.

**Methods:** This was a two-cycle audit in which notes were reviewed and data collected on the completeness of admission clerkings according to 46 domains derived from the RCS guidelines. Following this a surgical clerking proforma was introduced to the department. Data were then recollected in the second cycle and each domain was compared to the first cycle, using Fisher's exact test, with  $p < 0.05$  set as the level of significance.

**Results:** 43 patient notes were reviewed in the first cycle and 55 patients in the second. The proforma was used for 46 patients in the second cycle (83.6%). There was a significant improvement in the rate of documentation in 36 domains (78.3%) including on-call consultant name, medical history, social history, chest and cardiovascular examination, initial observations, initial blood test results and management plan including nil by mouth status ( $p < 0.05$ ). There was no difference in rate of documentation of patient demographic information and clerking doctor details. No difference was observed for documentation of the nature of allergic reactions.

**Conclusions:** The use of a clerking proforma for acute general surgical admissions improves documentation rates for key domains, allowing accurate information to be recorded and appropriate clinical decisions to be made. The proforma facilitates communication between multidisciplinary teams and saves time during subsequent patient reviews e.g. post-take ward round.

## Audit and Outcomes Research 0519

### Development of a visually rich, continuously incremental timeline based electronic patient record (EPR) with universal clinical application

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**Aims:** The national directive to move to paper-less working in the NHS by 2017 presents major challenges in information management. A key deficiency is the lack of a standard EPR interface design for heterogeneous record formats, hardware and software systems, which allows rapid oversight of complex clinical histories and direct access to underlying information resources. We aimed to develop an efficient system with universal application for the overview of clinical histories and for information access which would substantially reduce clinician screen time, frustration and inefficiency in the electronic workplace.

**Methods:** Using a rolling Design, Test and Adjust process, we conceived and developed (at minimal cost) a graphically rich, continuously incremental EPR with the ability to present all electronic information (documents, results, reports from 1990 onwards) held within our Clinical Data Environment in real time on each and every patient who has ever been treated at the hospital. Each clinical field (eg General Surgery, Cancer Care) is represented by a parallel, layered timeline on a single screen with access through representative icons to the underlying information.

**Results:** The alpha test system of this EPR allows the user direct oversight of any clinical history, and direct access to any underlying document/report/result from a range of software systems through a single screen in a rapid and highly intuitive way. It has also underwritten a timeline structured disease specific surgical oncology data system with wide practical applications in the study of chronic surgical conditions of childhood and adulthood.

**Conclusions:** The timeline EPR concept is readily adaptable to 'whole of life' clinical and organisational histories across all health care providers. It is intuitive and platform-independent, offering substantial savings in professional 'screen time'. It can be applied to all healthcare systems, subject to local IT organisation and software interface programming skills.

## Surgical Complications 0792

### Postoperative Remote Monitoring

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**Aims:** Hospitals are fined for readmissions occurring within 30 days following discharge. Early identification of problems may help to reduce the risk of readmission. The purpose of this trial was to evaluate the scope of an online

text-messaging system, intended to remotely monitor, diagnose common postoperative complications and assist surgical patients in the immediate post-discharge period (30 days).

**Methods:** FLO, short for Florence, is an NHS telehealth solution, commonly utilised for monitoring chronic health conditions, such as hypertension. We designed algorithms to monitor colorectal ERAS patients in the immediate post-discharge period, including well-being checks and basic observations (blood-pressure, heart rate and temperature). More complex algorithms were also created to diagnose and provide advice for 15 relevant postoperative symptoms. Patients were recruited within 48 hours of discharge and provided with training, equipment and information packs, and monitored for 30 days following discharge.

**Results:** Over a 4 week period, 16 patients were recruited to trial the service for 30 days; these patients did not receive the usual follow-up telephone call at 48 hours, unless they reported being unwell or did not make use of the technology. 11/16 patients utilised the service. 10/11 patients felt comfortable using the service and 9/11 would recommend it to a friend or family member. 2/11 patients were readmitted within 30 days, both had reported being unwell prior to readmission and both had uploaded abnormal temperatures. A total of 80 symptoms were reported and 86% of these were understood by FLO.

**Conclusions:** Remote monitoring of colorectal surgical patients following discharge is feasible utilising text-messaging. The software currently lacks the ability to accurately diagnose, but is useful as a screening tool to aid clinician intervention, and with the advent of emergency surgical hot clinics, may assist in the early recognition of complications before readmission occurs.

## General 0848

### A multicentre, risk adjusted assessment of Statins and NSAIDs in Abdominal Surgery

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**Aims:** Perioperative statin administration has been demonstrated to be effective in reducing complications in cardiovascular surgery. However, the role of statins within gastrointestinal (GI) surgery remains unclear.

**Methods:** This prospective, multicentre cohort study included consecutive patients undergoing GI resection. The effects of non-steroidal anti-inflammatory drugs (NSAIDs) or Statin administration were used to calculate adjusted odds ratios (OR and 95% confidence interval) using logistic regression and propensity score matching.

**Results:** Of all 1513 patients included, 443 received statins perioperatively. Patients receiving statins were substantially higher risk (ASA > 3, 28.24% vs. 52.37%,  $< 0.001$ ), but did not suffer significantly more postoperative complications (OR 0.94, 0.70–1.27), cardiovascular events (OR 1.01, 0.48–2.11) or anastomotic leak (OR 0.70, 0.35–1.34). After risk adjustment, patients on low dose statins (N=188) demonstrated reductions in major complications (OR 0.58, 0.31–1.07) and anastomotic leak (OR 0.19, 0.04–0.62,  $< 0.05$ ). Co-administration of NSAIDs and statins (N=54) was not associated with postoperative complications (OR 0.76, 0.42–1.39), cardiovascular events (OR 0.54, 0.03–2.97) or anastomotic leak (OR 1.98, 0.69–4.93).

**Conclusions:** Both NSAIDs and statins appear safe for use in the perioperative setting and may have a further role in reducing post-operative complications. Nevertheless, current observational evidence carries a high risk of bias. This data provides power for a randomised trial.

## Lower GI 1

### Cancer/Surgical Oncology (GI) 0404

#### Extra colonic findings of CT Colonography; Are they significant?

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**Aims:** Introduction: CT colonography (CTC) has already widely replaced conventional colonography as a method of examination of the colon. CT colonography detects cancer with a sensitivity of 96% which corresponds to the results of colonoscopy and allows the simultaneous assessment of the extra-colonic organs. To retrospectively audit both colonic and extra-colonic clinical results in our tertiary colorectal service.

**Methods:** Patients that underwent CT Colonography for a six month period starting January 2014 were assessed cross referenced with a list from clinical coding.

**Results:** Total number of patients n = 200. Age ranged between 29–95 years, median 71 years and mean 69.5 years (StD 14.9 years). Number of detected cancers were 11 (0.06%). Location specifics were namely Sigmoid 5, Ascending colon 3, Descending colon 1 and rectum 2. 2/11 (18.1%) of detected cancers also had concomitant polyps at different sites. Polyp were otherwise detected in 18 other patients with a mean size of 13.6mm. Diverticular disease was reported in 74 patients (37%). Findings varied and were mostly incidental, findings of Hiatus hernias in 22/200 (11%), liver cirrhosis 3, haemangioma 6, liver cysts 16, gallstones 20/200 (10%), pancreatic cysts 2/200 (1%), renal cysts 23/200 (11.5%), renal calculi 8/200 (4%), various herniae 7/200 (3.5%), colonic lipoma 2/200 (1%), vertebral fractures 9/200 (4.5%) and abdominal aortic aneurysms in 3/200 (1.5%). More significant findings such as gastric gastrointestinal stromal tumour in 2/200 (1%), pancreatic Neuroendocrine tumours in 3/200 (1.5%), incidental liver metastases 2/200 (1%), Adrenal adenomas in 4/200 (2%) and renal cell carcinomas in 5/200 (2.5%). Further investigations were recommended in 37/200 (18.5%) for clarification and/or confirmation mostly in the form of endoscopy or ultrasounds.

**Conclusions:** Our study elaborates incidental important pathological findings that could be missed with conventional luminal endoscopy. This demonstrates colonic detection rates and more importantly concomitant pathologies which otherwise be overlooked.

### Cancer/Surgical Oncology (GI) 0461

#### Outcomes of cytoreductive surgery combined with hyperthermic intraperitoneal chemotherapy (HIPEC) in 66 patients with colorectal peritoneal metastases

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**Aims:** Cytoreductive surgery (CRS) with hyperthermic intraperitoneal chemotherapy (HIPEC) is the optimal treatment for patients with pseudomyxoma peritonei. Over the last decade increasing evidence supports the use of CRS and HIPEC for selected patients with colorectal peritoneal metastases (CPM). A recent meta-analysis has shown improved survival in treated patients compared with systemic chemotherapy alone. We report our experience with CRS and HIPEC for CPM in a peritoneal malignancy centre.

**Methods:** All patients undergoing CRS with HIPEC for CPM over a 13 year period were identified. Data were collected using an established prospective database. Patient demographics, operative details and outcomes were analysed.

**Results:** Between 2000 and 2013, 66 patients with CPM were treated with CRS with HIPEC. Median age was 56 years (range 19–83) and median Peritoneal Cancer Index (PCI) was 11 (range 2–29). Median length of surgery and postoperative stay was 7.5 hours (range 5.5–11) and 15 days (range 7–65) respectively. No patients died within thirty days of surgery. Clavien-Dindo grade 3/4 complications occurred in 7 patients (10%).

Complete cytoreduction was achieved in 54 patients (82%) and major tumour debulking in 12 (18%) with a median survival of 29.1 months and 12.9 months respectively. After complete cytoreduction five year survival was 44.7%.

**Conclusions:** Favourable outcomes can be achieved with CRS and HIPEC in patients with colorectal peritoneal metastases. The best outcomes are seen in patients with limited disease who undergo complete cytoreduction combined with HIPEC. Patient selection is essential to maximise outcome whilst maintaining a low treatment related morbidity and mortality. This novel combination strategy is promising in selected patients with otherwise terminal colorectal cancer and centralisation of treatment in experienced centres is recommended.

### Audit and Outcomes Research 0506

#### The impact of adjuvant chemotherapy timing on overall survival following colorectal cancer resection

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**Aims:** This study investigates the impact of reoperation on adjuvant chemotherapy timing and its subsequent impact in colorectal cancer patients. Colorectal resection carries risk of surgical morbidity requiring reoperation in the immediate postoperative period. This may delay receipt of adjuvant chemotherapy, which in turn adversely impacts survival. This study aimed to investigate this impact, at a population level.

**Methods:** The English Hospital Episode Statistics administrative database was analysed between 1997 and 2012 and administrative codes for elective colorectal resections, reoperations and chemotherapy administration were collated. Multivariate logistic and Cox regression and Kaplan-Meier analyses were undertaken to ascertain predictors of chemotherapy delay and ascertain overall survival.

**Results:** 210,581 individuals underwent colorectal cancer resection. 40,479 (19.2%) received adjuvant chemotherapy with 18294/40479 (45.2%), 33434/40479 (82.6%) and 36808/40479 (90.9%) receiving it within 8, 12 and 16 weeks respectively. Sequentially worse overall survival was observed when the above cut-offs were utilised [8week: Hazard Ratio (HR) 1.23, Confidence Interval (CI) 1.20–1.27; 12week: HR1.39, CI 1.34–1.44; 16week: HR 1.51, CI 1.43 to 1.58; <0.001]. Reoperation was an independent predictor of adjuvant chemotherapy delay beyond 8 weeks (HR2.58, CI2.31 to 2.88, <0.001). 1571/40479 (3.9%) of this cohort had a reoperation in the first thirty days. 391/1571 (24.9%), 987/1571 (62.8%) and 1305/1571 (83.1%) of these patients received adjuvant chemotherapy within 8, 12 and 16 weeks respectively. Patients who avoided a reoperation and received timely adjuvant chemotherapy demonstrated the best five-year survival [no delay + no reoperation = 59%; no delay + reoperation = 53.5%, delay + no reoperation = 52.9%, delay + reoperation = 50.5%, Log rank <0.001].

**Conclusions:** Adjuvant chemotherapy delay adversely impacts colorectal cancer patients' survival and reoperation was a predictor of adjuvant chemotherapy delay. Efforts to prevent complications necessitating reoperation and to improve access to chemotherapy services, will improve survival in this patient group.

### Audit and Outcomes Research 0530

#### Efficiency of multidisciplinary team (MDT) meetings for cancer patients

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**Aims:** MDT meeting is central to providing secondary and tertiary cancer services but there is variation in the quality of how cancer teams work at local levels. We conducted a prospective audit assessing quality of cancer MDTs.

**Methods:** We adapted the MDT-QulC, a validated tool for evaluating quality of MDTs, through cognitive interviews and pilot testing.

**Results:** Data from 793 patients discussed at MDTs was collected. Remarkably, 233 patients (32%) did not have a treatment plan at the end of their discussion. Upon univariate analysis, patients were more likely to get a decision when someone who knows them ( $P < 0.001$ ) or their consultant ( $P = 0.003$ ) was present, case history ( $P = 0.045$ ) and pathological information ( $P < 0.001$ ) were available and oncologists were involved in the discussion ( $P = 0.001$ ). Upon multivariable analysis, having someone who knows the patient (odds ratio,  $OR = 0.32$ ,  $P < 0.001$ ), pathological information available ( $OR = 0.59$ ,  $P = 0.002$ ) and, to a lesser extent, involvement of medical oncologists in the discussion ( $OR = 0.70$ ,  $P = 0.055$ ) were associated with the formulation of a treatment plan.

**Conclusions:** Currently, MDTs fail to provide a treatment plan in a third of the patients. This could be improved by the attendance of the patient's consultants and pre-MDT screening of available information using defined proformas.

## Cancer/Surgical Oncology (GI) 0632

### Muscle Depletion is related to the host systemic inflammatory response in patients treated surgically for colorectal cancer

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**Aims:** Muscle depletion is characterized by a reduced muscle mass (myopenia) and increased infiltration by inter- and intramuscular fat (myosteatosis). It is recognised as a poor prognostic indicator in patients with cancer but the underlying factors remain unclear. We examined the relationships between CT defined skeletal muscle parameters and the systemic inflammatory response (SIR) in patients with operable primary colorectal cancer (CRC).

**Methods:** 763 patients diagnosed with CRC undergoing elective surgical resection between 2006 and 2013 were included. Image analysis of CT scans was used to calculate Lumbar skeletal muscle index (LSMI), and mean muscle attenuation (MA). The systemic inflammatory response was quantified by the pre-operative neutrophil to lymphocyte ratio (NLR) and albumin levels. Correlation and multivariate regression analysis was performed to identify independent relationships between patient SIR and muscle characteristics.

**Results:** Patients with  $NLR > 3$  had significantly lower LSMI;  $42.07 \text{ cm}^2 \text{ m}^{-2}$  versus  $44.27 \text{ cm}^2 \text{ m}^{-2}$ , ( $P = 0.002$ ) and MA;  $30.04 \text{ HU}$  versus  $28.36 \text{ HU}$ , ( $P = 0.016$ ) than patients with  $NLR < 3$ . Multivariate logistic regression analysis showed that high NLR ( $OR 1.78$  (95% CI 1.29–2.45),  $P < 0.001$ ) and low albumin ( $OR 1.80$  (95% CI 1.17–2.74),  $P = 0.007$ ) were independent predictors of reduced muscle mass. High NLR was significantly related with a low mean muscle attenuation and hence myosteatosis ( $OR 1.60$  (95% CI 1.03–2.49),  $P = 0.038$ ).

**Conclusions:** These results highlight a direct association between myopenia, myosteatosis and the host SIR in patients with operable CRC. A better understanding of factors that regulate muscle changes such as myopenia and myosteatosis may lead to the development of novel therapies that influence a more metabolically 'healthy' skeletal muscle and potentially alter cancer outcomes.

## Cancer/Surgical Oncology (GI) 0694

### Pre-operative assessment of the tumour inflammatory cell infiltrate using colonoscopic biopsies of patients with primary operable colon cancer

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**Aims:** The presence of a weak inflammatory infiltrate is associated with poor prognosis in patients with colon cancer, independent of TNM stage and other high-risk pathological characteristics. Although potentially modifiable,

identifying such patients prior to surgery is problematic. The aim of the present study was to examine the feasibility of assessment of the tumour inflammatory cell infiltrate utilising preoperative colonoscopic biopsies of patients undergoing primary elective resection of colon cancer.

**Methods:** Using an automated scoring system (nuclear h-score) the density of CD3 + T-lymphocytes was quantified in preoperative tumour biopsies of 56 patients undergoing elective resection of stage I-III colon cancer and compared to manual semi-quantitative (high vs. low) scoring of CD3 + density within the cancer stroma (CS) of resected tumour specimens.

**Results:** The median biopsy h-score was 44 (range 23–93). Patients with a high CD3 + density within the CS had a higher median h-score (57 vs. 41,  $P = 0.001$ ). The AUC for the relationship between biopsy h-score and a high CD3 + density was 0.754 (95% CI 0.618–0.890,  $P = 0.001$ ); the optimal cut-off for biopsy h-score was 44. Using this threshold, biopsy h-score had a sensitivity and specificity of 88% and 75% respectively; positive and negative predictive values were 72% and 89% respectively. In addition, a biopsy h-score  $\geq 44$  was associated with a high CD3 + density at the invasive margin and within the cancer cell nests. Furthermore, a low biopsy h-score showed a trend towards reduced five-year cancer-specific (73% vs. 89%,  $P = 0.110$ ) and overall survival (86% vs. 63%,  $P = 0.082$ ).

**Conclusions:** The results of the present study suggest that assessment of the inflammatory cell infiltrate utilising preoperative colonoscopic biopsies of patients with colon cancer is feasible. Although requiring independent validation, this may have significant implications for the provision of neoadjuvant therapy, particularly targeting the inflammatory cell infiltrate, in patients with primary operable colon cancer.

## Cancer/Surgical Oncology (GI) 0739

### An international comparison of malignant colorectal polyp clinical practice guidelines

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**Aims:** Due to the complex and broad nature of evidence on malignant colorectal polyp (MCP) management, clinicians rely on clinical practice guidelines (CPGs) to inform decision-making. This study qualitatively and quantitatively compared the internationally published guidelines on the management of malignant colorectal polyps.

**Methods:** A systematic literature search was undertaken to identify malignant colorectal polyp CPGs. Quantitative comparison was based on the Appraisal of Guidelines Research & Evaluation (AGREE II), a validated CPG appraisal tool which assesses 6 domains: scope & purpose; stakeholder involvement; rigour of development; clarity & presentation; applicability; and editorial independence. Histopathological risk factor assessment and treatment recommendations were further analysed for supporting levels of evidence and scientific agreement.

**Results:** Eleven International malignant colorectal polyp guidance were included. The AGREE assessment demonstrated significant variation in all quality domains across the CPGs. The scope and purpose domain showed the highest level of quality (median: 91%, interquartile range (IQR): 86–97%). The Applicability domain showed the lowest level of quality (median: 43%, IQR: 35–55%). Risk was attributed dichotomously (low/high risk) to malignant polyps in 8/11 CPGs and in a graded fashion in the remainder. Importantly, there were disagreements in which histopathological findings carried risk. Significant variation was found for degree of risk between CPGs for resection margins, tumour budding and depth of invasion. No CPG was able to provide a comprehensive analysis when multiple histopathological risk factors are present in an MCP. The indications and recommended approaches for local excision also demonstrated considerable variation between CPGs.

**Conclusions:** There is variation in evidence interpretation and recommendations between widely used malignant colorectal polyp CPGs. Improvements in the underlying evidence base, particularly to provide accurate histopathological risk factor assessment, are required to allow clinicians to provide personalised care to this complex patient group.

## Cancer/Surgical Oncology (GI) 0922

**The impact of colorectal cancer screening on malignancy detected via outpatient clinic and emergency admissions**R. Fernandes<sup>1\*</sup>, K. Chandrakumaran<sup>1</sup>, A. Venkatasubramaniam<sup>1</sup>, S. Arnold<sup>1</sup><sup>1</sup>Basingstoke and North Hampshire Hospitals, United Kingdom

**Aims:** The UK Cancer Reform Strategy in 2007 recommended The NHS Bowel Screening Programme be extended to incorporate those up to 75 years, on a background of screened 60–69 year olds. Flexible sigmoidoscopy to those aged 55 years is now being rolled out, with a view to extending this screening throughout the UK by 2016. It is postulated that as the screening programme develops, fewer patients will present as symptomatic cancers as acute admissions or referrals.

**Methods:** Our institution is a renowned colorectal hospital, with a large tertiary referral base. A retrospective analysis of all cases of colorectal malignancy since the advent of screening in 2008 was collated through an established patient database. Patient age, mode of presentation and tumour status at time of diagnosis were evaluated, along with post-operative histology. The data was grouped per age and into bi-annual groups: 2008–2009, 2010–2011, 2012–2013.

**Results:** There were 487 patients who had a diagnosis of colorectal malignancy inclusive of tertiary referrals and were aged >60 years. From these patients, 395 arose from referrals and acute admissions and 92 arose directly via the screening programme. There were no statistical differences in age, gender or Dukes Stage between each group either overall or between each bi-annual group. However, it is evident that in each sequential bi-annual year the proportion of patients diagnosed through screening rises; 17%, 18% and 22%.

**Conclusions:** Our results failed to demonstrate that following the introduction of the screening programme there was a reduction in patients presenting as emergencies or through the outpatient clinic with symptoms from their colorectal malignancy. However, it did demonstrate that the proportion of patients diagnosed through screening is progressively rising.

## Cancer/Surgical Oncology (GI) 0927

**The incidence of anastomotic leaks following anterior resection and associated risk factors**R. Fernandes<sup>1\*</sup>, G. Hughes<sup>1</sup>, K. Chandrakumaran<sup>1</sup>, S. Arnold<sup>1</sup>, V. Venkatasubramaniam<sup>1</sup><sup>1</sup>Basingstoke and North Hampshire Hospitals, United Kingdom

**Aims:** The development of clinical decision making, allied to the LOREC training programme and advances in surgical technology, has meant that many patients are now being offered restorative procedures as potentially curative surgery. One of the main concerns is the risk of anastomotic leak, and consequently careful patient selection is used to identify which patient should have a defunctioning ileostomy. Various patient-related, tumour related and technique related factors have been postulated as being risk factors for anastomotic leaks. A leak rate of 3–18% has been quoted by various authors following stapled anastomosis.

**Methods:** Retrospective data analysis, from a prospectively maintained database, was conducted on all cases over the preceding 10 years in which an anterior resection was performed in addition to a defunctioning ileostomy. Patient demographics, operative data, post operative imaging and case notes/letters were reviewed.

**Results:** 188 cases were analysed. The mean age was 67 years (23–86). Male:female ratio was 2:1. The mean ASA was II. The mean operative duration was 167 mins (98–625 mins). The mean distance to the anal verge was 6 cm. 81% were for malignant pathology and 14% were operated on as an emergency. 43% had undergone neo-adjuvant chemoradiotherapy.

There were clinical or radiological evidence of a leak in 17% and 12% still had their ileostomy one year after initial surgery. There were no identifiable factors that were statistically different between the leak and non-leak group.

**Conclusions:** Radiologically proven anastomotic leaks occur in approximately one in six patients undergoing a low anterior resection. In the majority of cases the leak was subclinical as the defunctioning ileostomy helped avoid

catastrophic events. Approximately one in eight patients may never have their ileostomy reversed.

## General 0959

**Specialised intestinal failure surgery in a large teaching hospital: A two year retrospective audit**P. A. Green<sup>1\*</sup>, M. Dibb<sup>1</sup>, A. Young<sup>1</sup>, R. M. Heath<sup>1</sup>, P. S. Rooney<sup>1</sup><sup>1</sup>Royal Liverpool and Broadgreen University Hospitals Trust

**Aims:** Patients with Type 2 Intestinal Failure (IF) are complex patients with high risks of intra-abdominal or central venous catheter (CVC) sepsis and abdominal wall defects following extensive surgery. We aimed to compare our practice with national guidance.

**Methods:** A retrospective audit was performed looking at all specialised IF surgical procedures undertaken in a large teaching hospital during a two year period. Isolated abdominal wall reconstructions were excluded from analysis. Overall infection rates for all patients receiving parenteral nutrition at our centre were calculated. Quality of care was assessed against indicators set by national ASGBI guidelines. Statistics were performed using Mann-Whitney U and Fishers Exact tests.

**Results:** 17 primary procedures were performed on 16 patients (10 Male), median age 50 years (Interquartile range (IQR) 33–68 years) (Table 1). 9 patients had inflammatory bowel disease, and 7 had intestinal failure of iatrogenic aetiology. Five operations were performed on fistulating disease, and 6 concurrent abdominal wall reconstructions were undertaken. Median length of stay was 37 days (IQR 10–80 days). One patient in our cohort suffered a CVC infection. Overall CVC infection rates at our centre are 0.35/1000 catheter days (Table 2). Two patients (11%) needed an unplanned return to theatre; however there was no 30-day mortality. There were five unplanned readmissions (29%). 15 (88.2%) patients required parenteral nutrition (TPN) pre-operatively, only seven (41%) needed TPN at 30 days after operation. Eight patients were discharged with Home Parenteral Nutrition.

**Conclusions:** Using an effective multi-disciplinary team approach, favourable operative outcomes can be achieved in patients with complex intra-abdominal disease and IF.

## Cancer/Surgical Oncology (GI) 0961

**Follow-up after surgery for colorectal cancer: the DISCLOSE study**S. A. Pugh<sup>1\*</sup>, K. L. Pearson<sup>1</sup>, G. Branagan<sup>2</sup>, J. N. Primrose<sup>1</sup>, DISCLOSE study group<sup>3</sup><sup>1</sup>University of Southampton, <sup>2</sup>Salisbury District Hospital, <sup>3</sup>The Wessex Surgical Trainee Research Collaborative, United Kingdom

**Aims:** The FACS trial concluded that regular follow-up with carcinoembryonic antigen (CEA) or CT imaging after curative treatment of colorectal cancer detected more treatable recurrences than minimal follow-up, irrespective of the stage of the tumour. The DISCLOSE study aimed to assess follow-up practice in seven NHS hospitals.

**Methods:** Multi-centre regional audit of patients completing treatment for Dukes' A-C colorectal cancer in 2008.

**Results:** 629 patients were included. The baseline characteristics were comparable to the FACS cohort: 347 (55%) were male, median age 73, 136 (22%) had a Dukes' A primary, 278 (44%) Dukes' B and 215 (34%) Dukes' C. Just 85 (13.5%) underwent detailed staging before embarking on follow-up compatible with entry to the FACS trial and this differed according to stage (Dukes' A 9.6%, Dukes' B 12.6%, Dukes' C 16.7%,  $p=0.048$ ). 318 (51%) patients were followed-up with CT and CEA, 107 (17%) with CEA alone, 58 (9%) with CT alone and 116 (18%) received minimal surveillance (30 undetermined). Overall 77% patients were regularly followed-up with CEA, CT or both although this varied from 22% to 98% between hospitals. Both the overall incidence of recurrence (15.3%) and incidence of surgically treatable recurrence (4.3%) were similar to FACS. By contrast the incidence of treatable recurrence differed according to Dukes' stage (stage A 1.5%, stage B 4.0%, stage C 6.5%,  $p=0.022$ ).

**Conclusions:** The majority of patients were not well staged before embarking on follow-up. There was clear variability between hospitals in terms of the method of surveillance used but the majority underwent regular follow-up with CEA, CT or both. This analysis suggests that Dukes' A patients may not benefit as much from follow-up, contrary to the findings of the FACS trial. This may reflect differences in staging and certainly highlights the importance of prospective clinical trials in determining optimal clinical practice.

## Audit and Outcomes Research 0971

### Patient Factors Predicting Delayed Discharge on the Colorectal Enhanced Recovery Programme

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**Aims:** To identify which preoperative patient factors are associated with delayed discharge in patients on the Colorectal Enhanced Recovery Programme.

**Methods:** Prospective data was collected for patients on the enhanced recovery pathway undergoing colorectal resections between October 2013 and July 2014. Preoperative patient data collected included ASA grade, BMI, age, comorbidities and CR-POSSUM score. These details were then compared to the length of stay. Delayed discharge was defined as from day four postoperatively onwards.

**Results:** Data was collected on a total of 50 patients. Three quarters of patients over the age of 80 suffered delayed discharge, compared to approximately one half of patients aged 80 or less. 57% of patients with ASA grade 1–2 suffered a delayed discharge, compared to 70% of people with ASA grade 3. 66% of patients with a BMI < 25 were discharged within 3 days postoperatively, whereas only 34% of overweight patients and 36% of obese patients were discharged within the same timeframe. Patients with three or more comorbidities were fifty per cent more likely to suffer a delayed discharge. There was no correlation between preoperative risk scoring and length of stay.

**Conclusions:** Patient factors most strongly associated with delayed discharge were BMI > 25, age greater than 80 years and having more than three comorbidities. ASA grade 3 was also associated with a delay in discharge. Such patients should therefore be identified preoperatively and selected for higher level care, in order to attempt to reduce length of stay. Further study would be required to assess the efficacy of such an intervention following its implementation.

## Cancer/Surgical Oncology (GI) 0995

### Perineal Reconstruction Following Abdomino-Perineal Excision: Results from a 'Hub and Spoke' Model

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**Aims:** Abdomino-perineal excision (APE) for anorectal malignancy, particularly following chemo-radiotherapy, is associated with a high rate of perineal wound complications. Biological meshes and tissue flaps such as Vertical Rectus Abdominis Myocutaneous (VRAM) or Inferior Gluteal Artery Perforator (IGAP) flaps can improve wound healing. Should this be carried out in the context of a district general hospital (DGH)? We present a single centre experience using such techniques in a 'hub and spoke' model with the regional plastic surgical unit.

**Methods:** A retrospective study of 21 patients undergoing APE for malignancy between January 2011 and June 2014 was conducted. IGAP flap reconstruction was performed by a visiting consultant plastic surgeon. Data collection included patient demographics, underlying pathology, neoadjuvant therapy and operative details, length of hospital stay, and wound complications. Patients were followed-up by both colorectal and plastic surgical teams.

**Results:** 21 patients (11 female, mean age 66 ± 12 yrs) underwent APE for cancer (20 rectal adenocarcinoma, 1 anal squamous cell carcinoma). 12 of these patients had received neoadjuvant chemo-radiotherapy. 3 patients had primary

closure, 7 biological mesh-assisted, and 12 had tissue flaps (5 VRAM and 7 IGAP). Mean length of hospital stay was 15 ± 8 days. There were no major complications following primary or mesh-assisted closure of the perineum. Perineal wound complications necessitating a return to theatre were seen in 3 patients who had undergone flap closure. Each had received neoadjuvant chemo-radiation

**Conclusions:** This data suggests that perineal reconstructions following APE for malignancy can be undertaken in a DGH setting using a 'hub and spoke' model with a regional plastic surgery unit

## Cancer/Surgical Oncology (GI) 1010

### Does negative bowel screening affect a possible subsequent symptomatic presentation?

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**Aims:** National Colorectal-cancer screening, utilising faecal occult blood testing (FOBT), is now well established in the UK. The aim of this study was to define the screening characteristics of patients presenting to secondary care with symptoms of colorectal cancer and to assess the effect of screening outcome on subsequent symptomatic presentation.

**Methods:** Retrospective analysis of all patients of screening age presenting via a two-week-wait (2WW) suspicion of colorectal-cancer pathway within one year (2012) in a tertiary trust. Colorectal-cancer related outcomes were compared between patients in the cohort who had previously accepted bowel cancer screening and patients who had previously declined bowel cancer screening. Primary endpoint was overall incidence of colorectal neoplasia. Secondary endpoints included incidence of colorectal malignancy, cancer-related mortality, cancer-related and polyp-related outcomes.

**Results:** Overall, 2,227 patients presented via the 2WW pathway; 955 were aged 60 to 75 years. Among the latter, 411 (43%) were previously screened and had a negative FOBT and 544 (57%) had declined screening. Incidence of colorectal neoplasia did not differ between groups (113, 27% versus 143, 26%, p=0.7). Of those with a negative FOBT and subsequent symptomatic presentation, 16 (3.9%) were diagnosed with a colorectal-malignancy compared to 36 (6.6%, p=0.08) in those who declined screening and had subsequent symptomatic presentation (CI 0.96–3.02 RR 1.7). There were no differences between the two groups with regards to cancer TNM stage, Duke's stage, metastases, number of polyps or cancer-related mortality (20 month median follow-up).

**Conclusions:** The incidence of colorectal neoplasia is similar between patients who previously had a negative FOBT and those who declined screening. There is a higher incidence of colorectal cancer detected among those who declined screening that did not reach statistical significance. All other cancer and polyp outcomes are similar between the groups.

## Cancer/Surgical Oncology (GI) 1024

### Is MRI sufficient as a sole imaging modality in rectal cancer staging?

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**Aims:** MRI is a validated imaging modality for rectal cancer staging, predicting and preventing inadequate excision of circumferential tumour spread: fundamentally preventing local recurrence. The role of endorectal ultrasound (ERUS) has been emphasized in recent times especially for lower third tumours.

**Methods:** Literature review of MRI and endorectal ultrasound in rectal cancer TNM staging. Subsequent retrospective review of rectal cancers in a district general hospital for the past 4 years comparing MRI staging and pathological staging.

**Results:** 147 patients with newly diagnosed rectal cancer between January 2010 and March 2014 were analysed. 45 were excluded due to incomplete data or sigmoid tumours. 65 of 102 had resectional surgery with curative intent. Of these

5 were upper third, 37 middle third and 23 lower third rectal cancers. Overall, T-staging was inaccurate for 29 patients (44.6%): 40% upper third; 40.5% middle third and 52.2% lower third tumours. 15/29 received neoadjuvant chemoradiotherapy, while 14 proceeded to primary resection. There is significant confounding from the use of neoadjuvant chemoradiotherapy, which is particularly common for margin threatening lower third tumours. If the over-staging in these patients can be accounted for by 'down-staging' as a result of neoadjuvant chemoradiotherapy, then our accuracy rates are comparable to other available data in literature (70.6%). Circumferential resection margin (CRM) was positive in 6/65, of whom 4 received neoadjuvant chemoradiotherapy for MRI predicted threatened CRM.

**Conclusions:** MRI proves to be an effective modality for rectal cancer staging in predicting CRM involvement with its subsequent positive impact in planning effective management. Although diagnostic accuracy for lower third rectal tumours may appear to be inferior to upper/middle third, accuracy rates after accounting for neoadjuvant treatment remains acceptable. The efficacy of ERUS remains controversial, as it is operator dependent with no convincing literature evidence of its superiority to MRI. ERUS could perhaps complement, but not replace MRI.

## Cancer/Surgical Oncology (GI) 1044

**Investigation of significance of apical node metastasis in colorectal cancer - does this correlate with N staging using TNM classification and are we consistently identifying the APN? A retrospective 5 year study of three hospitals**

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**Aims:** The aim of our study was to analyse the relationship between identification of a positive apical node and N staging of the TNM classification, as well as correlating pathological findings with pre-operative surgical intent (palliative vs curative). We also sought to investigate whether the APN is consistently being identified via routine pathological reporting.

**Methods:** We retrospectively analysed all 1115 colorectal cancer cases covering a 5 year period across three hospitals. Our data was drawn from our hospitals' clinical effectiveness databases which consist of robustly collected and nationally audited data and could therefore be considered reliable. We used this data to identify all cases where a positive apical node was present and examined how this related to the overall node status of each case. We also assessed how frequently the apical node was not identified through pathological examination.

**Results:** Our study revealed that in cases where APN metastasis was identified, 79% of patients had an N2 staging using TNM classification, and 19% had an N1 classification. Of all APN positive cases, 72% were recorded as operated with curative intent.

Within our study, we found that in 12% of cases the status of the apical node was not identifiable or not recorded, thereby showing us that despite evidence of its significance the APN status is not being consistently identified.

**Conclusions:** From these findings, we consider that identification of a positive apical node appears to consistently indicate significant lymph node involvement in colorectal cancer.

Given that APN status appears to be pathologically significant it warrants careful consideration in the clinical setting and during pathological analysis alongside the current TNM classification.

## HPB Upper GI Bariatric

### Audit and Outcomes Research 0139

#### Emergency versus elective laparoscopic cholecystectomy (LC) for treatment of symptomatic gallstone disease in a District General Hospital in England

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**Aims:** The emergency LC is increasingly becoming the treatment of choice for acute gallbladder symptoms. This audit compared the results of emergency versus elective LC for treatment of symptomatic gallstone disease.

**Methods:** 445 and 63 patients who underwent elective and emergency LC respectively at Russells Hall Hospital, Dudley, for symptomatic gallstone disease from 2011 to 2014 were analyzed. Gender, Age, BMI, ASA grade, symptom profile, prior hospital admission episodes, duration of surgery, post operative hospital stay, surgical complications and histology were analyzed. For the emergency group, the patients with the first episode of either a biliary colic or cholecystitis were included.

**Results:** Both groups majority were females and were in either ASA grade I-II. Among the elective group, majority had 1–3 prior hospital admissions. The duration stay in each admission was 3.1 +/- 1.9 days. The duration of last admission to the surgery was 28.4 +/- 12.1 days. The mean duration of surgery and the post operative hospital stay were 42.3 +/- 12.2 min. and 24.4 +/- 6.3 hours respectively. The rate of conversion was 2.4%. The commonest complication was the post-operative bile leakage (5). Among the emergency group, the duration of acute symptoms was 2.2 +/- 1.7 days. The duration of admission to the surgery was 24.4 +/- 12.1 hours. The mean duration of surgery and the post operative hospital stay were 46.3 +/- 14.2 min. and 24.8 +/- 14.3 hours respectively. The rate of conversion was 4.7%. No statistical significance observed in the duration of surgery, post operative hospital stay and complications among the two groups ( $p > 0.05$ ). However the rate of conversion showed a significant difference ( $p = 0.003$ ).

**Conclusions:** Although the conversion rate was high, this procedure may provide the economic advantage of a markedly reduced total hospital stay.

### Audit and Outcomes Research 0188

#### Biliary Pancreatitis: Time to Definitive Management

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**Aims:** All patients with gallstone pancreatitis should undergo definitive management (cholecystectomy or endoscopic retrograde cholangiopancreatography with sphincterotomy) on index admission or within 2 weeks from discharge. This audit assesses compliance to this standard, as defined by the UK Guidelines for the Management of Acute Pancreatitis, before and after the implementation of a care pathway at a single centre.

**Methods:** Retrospective audit of patients admitted with Gallstone Pancreatitis to a single centre over a 8 month period following the introduction of a care pathway (Group A) and compared to i) the national standard and ii) results obtained from a previous retrospective audit at the same centre between 2006–11 (Group B). Fisher's exact test and students' t test are used as appropriate.

**Results:** Group A n=68, median age 60 (range 18–93). Group B n=118, median age 53.5 (range 18–84). Definitive management on index admission or within 2 weeks from discharge has improved from 15% to 47% ( $p = 0.0001$ ). Median delay to intervention is 42 days (range 2–224) from 61 days (range 1–170) from group A and B respectively ( $p = 0.37$ ).

**Conclusions:** Introduction of a care pathway consisting of a clerking proforma and increased access to theatre with a flexible half day 'hot-gallbladder' list has improved timing to definitive management of patients with gallstone pancreatitis. Compliance at 47% is well above the national standard of 34.2% but below that demonstrated by Modifi et al. Early intervention, either surgical or endoscopic, should be offered to these patients in order to reduce readmissions and complications of subsequent gallstone pancreatitis.

### Audit and Outcomes Research 0191

#### Readmission rates in patients with gallstone pancreatitis

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**Aims:** Readmission rates, especially in surgery, are used as an indicator of quality of care delivered. This study assessed readmission rates, due to biliary pathology or complications of treatment, for patients admitted with gallstone pancreatitis that underwent definitive management, at a single centre.

**Methods:** Retrospective review of patients admitted with gallstone pancreatitis between March 2013 and October 2013 at a single centre. Clinical notes were interrogated and corroborated with electronic records to identify patients who were readmitted due to complications of gallstone disease or complications following intervention for gallstone disease.

**Results:** 68 patients were admitted with gallstone pancreatitis, 90% (60) underwent definitive management. Readmission rates reduced from 19.1% to 4.4% following intervention. For patients undergoing cholecystectomy readmission rates reduced from 33% to 2.6% following their operation. For patients undergoing endoscopic cholangiopancreatography with sphincterotomy readmission rates reduced from 33% to 17%. The relative risk reduction in readmission is 12.8 ( $p = 0.0008$ ) and 1.9 ( $p = 0.37$ ) for cholecystectomy and sphincterotomy respectively. 40% of readmissions were in the first month from discharge and 60% of readmissions were in the following 4 months. Readmissions accounted for a further 56 inpatient days.

**Conclusions:** This study highlights the importance of early definitive intervention for patients with gallstone pancreatitis. Only 1 patient was readmitted following cholecystectomy and 4 following sphincterotomy. It is safer and best practice to perform intervention on index admission reducing the risk of complications, in particular further gallstone pancreatitis. Extrapolating this data, per annum our trust would save 84 inpatient days if all those who could undergo definitive management did so on index admission.

### Audit and Outcomes Research 0192

#### Management of Acute Pancreatitis: An Audit Cycle

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**Aims:** To audit the management of patients with acute pancreatitis against national standards, as defined by the UK Guidelines for the Management of Acute Pancreatitis, and to compare results with a previous audit following the introduction of a care pathway.

**Methods:** An initial audit was undertaken on 50 consecutive patients admitted with acute pancreatitis from the 1 st January 2011 (Group A). Results of which were presented at the 20th International Congress of the European Association for Endoscopic Surgery in Brussels. Following this a care pathway was developed and introduced based on the national guidelines. The second loop of the audit cycle was a retrospective analysis of all patients admitted to this centre with acute pancreatitis between 1 st March 2013 and 1 st October 2013 (Group B).

**Results:** 50 patients in Group A, median age 54.5 (range 24–93) with a male to female ratio 1:0.7 and median length of stay 3 days (range 0–24). 131 patients in Group B, median age 52 (range 18–93) with a male to female ratio of 1:1.15. The correct diagnosis within 48 hours, idiopathic cases, ultrasound examination within 24 hours of admission and definitive management of gallstones improved from 96% to 99%, 24% to 21%, 48% to 75% and 30% to 46% respectively. Mortality in predicted severe disease did not change significantly from 12.5% to 11% but a higher percentage were admitted to the intensive care or high dependency setting (12.5% in Group A to 19% in Group B).

**Conclusions:** A complete audit cycle was undertaken at our trust. Introduction of a care pathway has resulted in the improvement of 4 standards, allowed for more accurate data recording, collation and provides an educational role.

## Audit and Outcomes Research 0260

### Reciprocal Relationship Between Compliance with Post-OP Follow-up and Weight Loss After Bariatric Surgery

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**Aims:** Bariatric Surgery (BS) is one of the subspecialties in which regular post-operative follow-up significantly improves outcomes in addition to providing essential patient and procedural data. NICE and BOMSS recommend a 2-year regular follow-up plan for all patients at specialist Bariatric services, followed by life-long annual review in the community.

The aim of this single-centre retrospective study was to: (1) Measure patient compliance with post-op follow-up appointments; (2) Explore the relationship between compliance and weight loss.

**Methods:** Clinic attendance data between 2009–2013 were analysed at these postop intervals: 1–2month, 3–4month, 5–6month, 8–9month, 10–12month. For weight loss figures, patients attending at 10–12month were chosen. Per cent excess weight loss (%EWL) was calculated based on BMI of 25.

**Results:** 164 post-BS patients with similar initial BMI were included (70 LAGB, 70 Sleeves and 24 By-Passes). Attendance at post-op appointments steadily declined with 83.75% patients attending at 1–2 (P=ns), 52.25% at 5–6 (P=0.011) and 61.25% at 10–12 months (P=0.002). Number of appointments attended by LAGB, Sleeve and By-Pass patients did not differ significantly (Median 3–4; P=0.1–0.46). EWL figures at 10–12 months were available for 36 LAGB (51.42%), 43 Sleeve (61.42%), and 16 (66.67%) By-Pass patients. LAGB patients with poor compliance (3 or less appointments) lost significantly less weight than those with 4 or more appointments (%EWL 15.9 vs. 33.7; P=0.01–0.004), while the same did not affect %EWL for Sleeve and By-Pass patients (P=0.26–0.72). Interestingly, initial weight loss also affected subsequent attendance. Patients who managed to achieve >20% EWL at 1–2 months attended significantly less appointments compared to those with ≤20% EWL (P=0.0012).

**Conclusions:** Regular follow-up enhances EWL for LAGB patients who are likely to benefit from frequent adjustments. Compliance-EWL relationship appears bi-directional with a higher EWL early on resulting in higher DNA rates. Strategies such as pre-/post-op group sessions and telephonic reminders before appointments may help.

## Audit and Outcomes Research 0312

### An Audit Of The Management Of Patients With Acute Pancreatitis Against The National Guidelines In A Remote Rural General Hospital

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**Aims:** The aim of this study was to audit the management of patients with acute pancreatitis against the standards of practice in the British Society of Gastroenterology guidelines in the setting of a remote rural general hospital.

**Methods:** The study assessed consecutive patients with acute pancreatitis over 21 months from September 2012 till May 2014. Audit targets were overall mortality below 10%, mortality for severe acute pancreatitis below 30%, correct diagnosis and severity stratification within 48 hours (h), aetiology determined in more than 80%, availability of ultrasound scan within 24h, availability of computed tomography (CT), high-dependency (HDU) or intensive therapy units, referral to specialist unit when indicated and definitive treatment of gallstone pancreatitis within 2 weeks.

**Results:** Of 62 patients with acute pancreatitis, 11 (17.7%) had severe acute pancreatitis. Overall mortality was 3.2%, and 18.2% in those with severe acute pancreatitis. Diagnosis was made within 48h of presentation in 96.8%, however, only 62.3% were stratified. The definitive aetiology was classified in 77.4%. Ultrasound scan was done for 59.5% within 24h of admission. 32.2% of all patients had CT within 24h. Nine out of ten patients, in whom HDU admission was indicated, were managed in HDU. Discussion with the surgeons in specialist unit occurred in nine out of ten patients who fit a regionally agreed referral criteria, two patients were transferred acutely. Of 25 patients with acute gallstone pancreatitis, 76.6% underwent definitive management within 2 weeks of admission.

**Conclusions:** Patients with acute pancreatitis can be managed according to the national standard of practice in rural hospitals with a low associated mortality. Publishing a simple pathway based on the national guidelines as a poster in emergency department and surgical ward is recommended to further improve the process of management

## Minimally Invasive Surgery 0315

### Variation in day-case practice for laparoscopic anti-reflux surgery across England: A 5-year review.

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**Aims:** The GORD guideline from the Association of Upper Gastro-intestinal Surgeons (AUGIS) and Royal College of Surgeons states that providers of laparoscopic anti-reflux surgery should be able to demonstrate a median length of stay of 2 days and demonstrate a day-case rate. The purpose of this study was to quantify day-case rates following laparoscopic fundoplication surgery in England.

**Methods:** Data from 2009–2014 was obtained from the NHS England Hospital Episode Statistics (HES) database using the Surgical Workload Outcomes Research Database (SWORD) database under the auspices of the AUGIS and Association of Laparoscopic Surgeons (ALS) organisations. Inclusion criteria comprised laparoscopic anti-reflux procedures performed in adults across all centres in England. Data collected included activity volume, day-case rate, length of stay and readmission rates at 2, 7 and 30 days.

**Results:** The median number of laparoscopic anti-reflux procedures performed annually in England across the 5-year period was 1781 (range 1740–1915.) The national mean length of stay was uniform across the period (2.1 days, range 1.9–2.2). National mean day-case rates for laparoscopic anti-reflux procedures increased from 6.4% in 2009–2010 to 11.2% in 2013–2014. Regional reported rates of day-case procedures ranged from 0.7% (n=2) to 33.1% (n=88) in 2013–2014. Wide variation exists between NHS Trust providers ranging from no cases performed as day-case to 83% (n=65).

**Conclusions:** Wide variability exists in the provision of laparoscopic anti-reflux surgery as a day-case procedure in England. It has been shown to be possible to provide safe and successful day-case provision and there are cost-saving benefits implied with this. Work needs to be done to identify why this national variation exists, with a corresponding shortfall in patient choice and experience.

## Audit and Outcomes Research 0329

### Nutritional Enhanced Recovery: post-pyloric feeding after discharge following oesophagectomy

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**Aims:** Oesophagectomy is associated with pre- and postoperative nutritional difficulties, including protein-energy malnutrition (defined as > 10% weight loss). Postoperative nutritional enhanced recovery (NER) aims to optimise nutrition with early reintroduction of enteral feeding by post-pyloric feeding (nasojunal tube or surgical jejunostomy) and a period of overnight enteral feeding following discharge. This audit aimed to investigate the influence of NER on postoperative weight changes at 3-, 6- and 12-months.

**Methods:** This retrospective audit reviewed case notes for 214 patients who underwent oesophagectomy between 1st January 2012 and 30th April 2014. Mann-Whitney analyses were conducted, <0.05 denotes statistical significance.

**Results:** At 3-, 6-, and 12-months postoperatively, overall median weight loss was clinically significant at -8.85 kg [-11.6%], -9.05 kg [-12.23%], and -10.0 kg [-13.3%] respectively.

Patients who had post-pyloric feeding continued following discharge (N = 32) had significantly less weight loss from discharge until 3-months postoperatively compared to those with no supplementary feeding (-4.6 kg [-5.4%] vs. -12.3 kg [-13.8%], <0.001).

Weight loss in the post-pyloric feeding cohort was shown to increase following cessation of feeding (median duration postoperatively: 82 days [range: 22–181 days]) however there remained a significant difference at 6-months (-8.05 kg [-10.6%] vs. -13.1 kg [-14.8%], p=0.007) and by 12-months there was no significant difference (-11.3 kg [-14.1%] vs. -11.2 kg [-14.0%], p=0.505).

**Conclusions:** Oesophagectomy is associated with substantial weight loss over a short time period and protein-energy malnutrition. Postoperative weight loss and malnutrition can be significantly reduced with post-pyloric feeding following discharge. However with cessation of supplementary feeding, the reduced weight loss seen in the NER group is diminished. The clinical team should consider this when deciding the appropriate duration of post-pyloric feeding to nutritionally optimise postoperative patients and continue to provide dietetic and nutritional supplementation once feeding is stopped to minimise weight loss. This audit supports the implementation of post-pyloric feeding following discharge under dietetic supervision.

## Emergency Surgery including Trauma (ASGBI) 0384

### A novel approach to improving the definitive management of gallstone pancreatitis in the district general hospital setting. - A 'Hot Gallbladder' service

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**Aims:** Current guidelines state that patients presenting with mild acute gallstone pancreatitis should have definitive management of gallstones during their index admission or within 2 weeks of discharge. This can be difficult to achieve in a district general hospital; elective waiting lists are long and there are limited numbers of surgeons and limited time on emergency lists to perform laparoscopic cholecystectomy acutely. This audit compares the practice before and after the implementation of a 'Hot Gallbladder Service', where 3 weekly spaces were created on elective Upper GI lists for acute laparoscopic cholecystectomies. This is to allow time for patients presenting with biliary pathology, including gallstone pancreatitis, to be managed acutely.

**Methods:** Patient data was collected from paper and computer case notes over two 4 month periods. Data was collected retrospectively from April to July 2013 and then prospectively from August to November 2014.

**Results:** There were 11 patients with mild gallstone pancreatitis in the retrospective group and 15 patients in the prospective group. Definitive management was either with laparoscopic cholecystectomy or, if the patient were unfit for surgery, an ERCP and prophylactic sphincterotomy. 3 patients in the retrospective and 6 in the prospective group were thought medically unfit for surgery.

Before the introduction of the hot gallbladder service, 3/8 (37.5%) of patients had a laparoscopic cholecystectomy within 2 weeks (range 14–100 days). After the introduction of the acute service 8/9 (89%) had a laparoscopic cholecystectomy within 2 weeks. Overall, including ERCP, definitive management of gallstones was achieved in 45% of patients prior to, increasing to 80% after, acute 'hot gallbladder' service introduction.

**Conclusions:** The use of a 'Hot gallbladder service' is a novel way to improve the definitive management of patients with gallstone pancreatitis in the district general hospital setting, though further improvement is still required to meet current pancreatitis guidelines.

## General 0494

### Peptic ulcer disease in the era of proton pump inhibitors - a population analysis

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**Aims:** Peptic ulcer disease (PUD) is a cause for significant mortality and morbidity. There is a substantial reduction in surgical interventions for uncomplicated PUD since the discovery of proton pump inhibitors (PPIs) and triple therapy for Helicobacter pylori eradication. Despite this the management of PUD and its complications continues to be a challenge.

**Methods:** We evaluated national outpatient PPI prescribing data and population-based trends for patients with perforated PUD admitted to hospitals in Ireland from 1995 to 2010. This population-based retrospective cohort study was conducted using the Hospital In-Patient Enquiry (HIPE) database and the Primary Care Reimbursement Service (PCRS) database.

**Results:** A total of 4332 patients were admitted in Ireland with perforated PUD over the time period, of which 83% were localised to the duodenum. The age-adjusted incidence of perforated duodenal ulcers significantly decreased from 103.9 to 62.6 per 1,000,000 population, while the incidence of perforated gastric ulcers remained the same over the time period. This coincides with a massive increase in outpatient PPI prescribing, with just a '8.6 million spent in 1995 and over a '100 million spent in 2010. Over 80% of patients were treated operatively and the death rates in this cohort did not change over the time period, despite increased use of preoperative CT and laparoscopic surgery.

**Conclusions:** With the widespread introduction of PPI prescribing, the incidence of perforated duodenal ulcer has decreased, however operative mortality rates have not improved despite the widespread availability of computed tomography and laparoscopy.

## Audit and Outcomes Research 0507

### The impact of bariatric surgery on patient mobility using a novel ambulation scoring system (BARS score)

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**Aims:** Obesity is associated with reduction in mobility; however Bariatric services currently lack a tool to objectively assess post-operative patient mobility. We introduce the novel Imperial Bariatric Ambulatory Restriction Severity (BARS) Index to address this need. This provides a score to reflect functional mobility status of the preceding 3 months. Our aim is to evaluate the impact of bariatric surgery on patient mobility using the BARS Index. The parameters studied include: weight loss and type of surgery.

**Methods:** This is a prospectively recorded and retrospectively reviewed study of 106 patients who underwent laparoscopic bariatric surgery between 2009 and 2014. Data was obtained from medical records, and telephone consultation. A BARS score was assigned as part of the preoperative assessment and follow up.

**Results:** A pre-operative BARS score of 3 was most common (n=81), with the rest ranging from 1–8. There was a statistically significant decrease between pre-operative mean weight and each follow-up year (<0.01), with minimum mean weight in year 3 (89.9 kg ± 22.2 kg), followed by an increase in years 4 and 5 (91.5 ± 22.8 kg and 102.5 ± 34.5 kg). There was a statistically

significant decrease between the mean pre- and post-operative BARS score from the 6 month follow up ( $<0.01$ ). Sleeve gastrectomy patients had consistent post-operative improvement for mean BARS score, from  $2.6 \pm 0.8$  to  $1.7 \pm 0.4$ . Bypass improved the mean BARS score from  $3.0 \pm 0.9$  to  $1.5 \pm 10.6$  over 4 years, and Band decreased the score from  $3.1 \pm 1.3$  to  $2.1 \pm 0.6$  over 5 years.

**Conclusions:** Mobility improves over 5 years post-bariatric surgery in line with weight loss and the BARS index is an effective tool to objectively assess the functional improvement. Further validation of this novel tool is still required.

## General 0527

### Helicobacter Pylori's migratory influence in patients taking proton pump inhibitors and associations between proximal gastric and duodenal biopsies using a BIOHIT rapid assay

#### Running Title: Best Site for Rapid Urease Test in Previously Treated H.pylori

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**Aims:** This study investigated the effect of Proton Pump Inhibitors (PPIs) on the location of Helicobacter Pylori (H.pylori) in the gastrointestinal tract, using rapid urease test to find out if there is any evidence that the use of PPIs will result in the migration of H.pylori proximally to the stomach body or distally to the duodenum.

**Methods:** Cross-Sectional study on symptomatic patients attending endoscopy unit for gastroscopies. Two groups were recruited, we called the first group the proton pump inhibitor group (PPI) which included those who are currently on PPIs or received PPIs in the last two months ( $n=61$ ). The second group labelled as the control group included those who did not receive PPIs in the last two months ( $n=55$ ). Tissue samples from the duodenum, stomach body and the antrum were taken from every participant for rapid urease test.

**Results:** Comparisons of proportions of positive and negative urease tests between the three sites on the same individual were calculated. Positive results were very low in the Duodenum for both groups. Interestingly, H.pylori migrate to the body of stomach in those patients taking PPIs with a statistically significant result ( $X^2=65$ ,  $P\text{-Value}=0.000$ ) Table 1. By studying estimated proportions among the PPI group only, we found that the usage of PPIs will result in migration of H.pylori proximally towards the body of stomach ( $X^2=36.578$ ,  $P\text{-Value}=0.000$ ) Table 2.

**Conclusions:** H.pylori migrates proximally in the stomach in patients taking PPIs. This study shows the importance of PPIs as a confounding variable which needs adjustment when studying the best site for detecting H.pylori.

All patients attending endoscopy units for gastroscopy should have samples taken from both antrum and stomach body if they have taken proton pump inhibitors in the last two months.

## Audit and Outcomes Research 0617

### Bariatric Surgery in Patients with Type 2 Diabetes

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**Aims:** Bariatric surgery for the treatment of obesity is an increasingly available intervention and studies suggest this could result in rapid improvement in glycaemic control in patients with type 2 diabetes mellitus (T2DM). It becomes increasingly relevant considering the recently released NICE guidelines. The aim was to assess the effect of post-operative weight loss on glycaemic control.

**Methods:** This was a single-centre retrospective analysis of 16 patients identified with T2DM undergoing bariatric surgery in 2012. An audit tool was developed and retrospective case-note analysis performed. Information

was collected on procedure type - laparoscopic sleeve gastrectomy (LSG) or laparoscopic Roux-en-Y gastric bypass (LRYGB), weight, HbA1c and diabetic medications pre-operatively, at 6 months, and 12 months. Quantitative and statistical analysis was performed.

**Results:** 44% had LSG ( $n=7$ ), 56% had LRYGB ( $n=9$ ). Mean pre-operative weight was 122.5 kg, 99 kg at 6 months, and 96.2 kg at 12 months, with mean excess weight loss of 48.4%. Pre-operative mean HbA1c was 55.4 mmol/mol, 42 mmol/mol at 6 months ( $p=0.0002$ ) and 40.0 mmol/mol at 12 months ( $p=0.03$ ). Pre-operatively 12.5% were diet-controlled, 25% metformin monotherapy, 44% dual/triple oral therapy, and 19% required insulin. At 6 months 94% required only metformin monotherapy, with 100% achievement of diabetes remission at 12 months (HbA1c  $<47$  mmol/mol continuing on maximum metformin monotherapy).

**Conclusions:** There was significant weight loss at 6 and 12 months post-operatively, with no significant difference between the LSG and LRYGB groups. 73% of patients had  $>30\%$  excess weight loss at 12 months. HbA1c was significantly reduced at 6 and 12 months post-operatively with all diabetic patients achieving remission at 12 month follow-up. Excellent outcomes can be achieved from bariatric procedures in addition to weight loss including rapid improvement in glycaemic control in T2DM. This is attained through careful patient selection, pre-operative assessment and optimisation of comorbidities, and a multidisciplinary approach.

## Audit and Outcomes Research 0634

### Coding in Surgery: Impact of a specialised coding proforma in Hepato-pancreato-biliary surgery

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**Aims:** Coding inaccuracies in surgery misrepresent the productivity of Trusts and outcome data of individual surgeons. They also have significant financial ramifications. Our aim was to audit the extent of coding inaccuracies in hepato-pancreato-biliary (HPB) surgery and assess the financial impact of introducing a coding proforma.

**Methods:** Coding data of patients who underwent elective HPB surgery over a 3 month period was audited. Diagnosis and operative codes were based on ICD-10 and OPCS-4 codes. A coding proforma was then introduced and its impact on accuracy was assessed. New human resource group (HRG) codes were assigned to accurate codes and new tariffs given. A cost analysis was performed to evaluate the financial implications of a coding proforma.

**Results:** Prior to the introduction of the coding proforma 42% of patients had the incorrect diagnosis and 49% had missing co-morbidities. In addition, 14.5% of primary procedures were incorrect and 36.7% had additional procedures that were not coded for at all.

Following the introduction of the coding proforma there was a 27.5% improvement in the accuracy of primary diagnosis and 21% improvement in co-morbidities. There was a 7.2% improvement in the accuracy of coding primary procedures and a 21% improvement in the accuracy of coding of additional procedures. 14% of cases did not have a coding proforma completed and 7% of proformas were incomplete.

Financial loss as a result of coding inaccuracy over our 3-month study period was £36,002 with an estimated annual loss of £144,008.

**Conclusions:** Owing to the complex nature of HPB surgery and the patient case-mix, coding in HPB surgery is prone to coding inaccuracies. A coding proforma completed 'in theatre' by the surgeon and anaesthetist improves the accuracy of coding and prevents a substantial loss of income for the Trust.

## Breast/Endocrine 0833

### Usefulness of Computerized Tomography as a diagnostic key when suspicion of postoperative complications on Bariatric Surgery

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**Aims:** Early detection of postoperative complications of bariatric surgery is essential due to its high morbidity and mortality. The aim is to analyze the usefulness of performing CT in postoperative bariatric surgery when there is suspicion of abdominal complications.

**Methods:** 201 patients operated of morbid obesity during 2010–2011 are included in the analysis. Criteria to request an abdominal CT are:

Patients with an abnormal clinical course based on fever, pain, leukocytosis or criteria shock.

-Evidence of serious abdominal complications as a method to establish the best management.

**Results:** 31 CTs are performed with suspicion of abdominal complication (15.42%). In 12 cases there are significant findings: 6 fistulas, 2 bowel obstructions, an intra-abdominal collection, an intra-abdominal hematoma, a wall hematoma and a splenic infarction. Five of the patients with fistula are reoperated and the other one is managed conservatively since the CT shows good drainage of the fistula. There were no readmissions and no deferred complications in patients in which CTs did not identify any problems.

**Conclusions:** In our series, abdominal CT showed a sensitivity and specificity close to 100% for the diagnosis of intra-abdominal complications. Moreover, in patients with an established complication CT allows to design the best strategy to follow, avoiding in some cases the need of a reoperation.

## Audit and Outcomes Research 0884

### Time to laparoscopic cholecystectomy - a pilot retrospective study

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**Aims:** The aims of this retrospective cross sectional study were:

To explore the timelines for the outpatient to theatre and A&E to theatre pathways To assess acute cholecystitis waiting times and gallstone pancreatitis waiting times with respect to pre-operative admissions

**Methods:** Data of patients who had cholecystectomy in a single calendar year was generated. A proforma was created to standardise data extraction. The variables recorded included - age, gender, ASA, diagnosis at first presentation, time from first presentation to surgery, type of surgery, number of related preoperative admissions. Frequencies were used to describe demographics whilst statistical analysis for association was done using SPSS. (significance at the 5%).

**Results:** 100 cases were reviewed (24 males: 76 females) with a mean age of 48+/-14.9 years. Biliary colic was the most common initial presentation (65%), 24 presented with acute cholecystitis, 10 with gallstone pancreatitis and one 1 with gallbladder perforation. The time from first presentation to surgery for patients with acute cholecystitis ranged from 12 weeks to 137 weeks and from 7 weeks to 25 weeks for patient with gallstone pancreatitis, with an equal number of preoperative admissions in both groups. There were statistically significant correlations between the number of pre-operative admission and the time to surgery whilst patients presenting to A&E had a greater number of preoperative admissions than those first seen in outpatient clinics.

**Conclusions:** Neither the traditional 6 week timeline for surgical intervention after presentation with acute cholecystitis nor the 2 week deadline for surgical management of gallstone pancreatitis were achieved in this population. Patients presenting acutely to A&E had a greater delay to surgery along with greater numbers of preoperative hospital admissions. The delay in elective cholecystectomy can influence the number of pre-operative admissions with gallbladder related pathology leading to patient distress and increased financial burden on the hospital service.

## General 0944

### Endoscopic Management of Choledocholithiasis in the Elderly: A Single Centre Experience

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**Aims:** Elderly frail patients with large or multiple common bile duct (CBD) stones offer a significant management challenge with potential for high morbidity and mortality. Our aim was to review the outcomes of endoscopic bile duct plastic stenting as a definitive treatment in these patients managed at our institution.

**Methods:** Patients aged > 65 years undergoing endoscopic retrograde cholangiopancreatography (ERCP) with bile duct stenting as definitive management for large or multiple stones were identified from our unit database. A historical cohort was used (2006–2008) to allow sufficient time to monitor outcome.

**Results:** We identified 21 patients that met our inclusion criteria. These patients were elderly with mean age 84 (range 67–93), had multiple comorbidities and had either large or multiple stones and/or difficult anatomy where clearance of the bile duct was possible. They were managed by insertion of double-J plastic biliary stents with conservative management and no plan for repeat ERCP or surgery.

The median survival of this group of frail, elderly patients was only 45 months (range 1–87) with only 4/21 alive at the end of the study period. None died of biliary related complications. 7/21(33%) patients required one further ERCP and two patients required multiple (two and three respectively) further procedures. Of these 9 patients, only 3 required admission to hospital for biliary sepsis (mean of 8.6 - range 4–15 days).

The remaining 12/21(57.1%) were entirely free of biliary sepsis or problems and required no hospital intervention or treatment for biliary related causes until the end of follow up.

**Conclusions:** Long term ERCP inserted double-J plastic stent insertion provides good palliation of CBD stones in patients who are deemed high risk/inappropriate for surgical intervention. Although one third of patients required a further stent change none suffered serious biliary sepsis nor required definitive surgery and in only two patients were multiple procedures required.

## General 0960

### Feasibility of Skype appointments for follow-up with post liver cancer resection patients

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**Aims:** Leeds Hepatobiliary unit performs over 200 malignant liver resections yearly, with patients referred from a wide geographical area. Patients require 10 years follow-up post-operatively. This study aimed to explore feasibility of Skype for post-operative follow-up.

**Methods:** Cancer resection follow-up patients attending three weeks of outpatient clinics were surveyed to explore opinions of Skype for follow-up. The concept was discussed at the hospital Cancer Patient and Public Involvement group. Skype reliability was tested on Trust computers by piloting calls with staff off site on normal internet broadband. Patient recruitment to a feasibility study has started. Cost data was analysed to determine cost-effectiveness of Skype.

**Results:** Ten patients completed the clinic questionnaire. 40% had Skype access, however 60% were keen to participate. Enthusiasm for the study came from clinic patients and the Cancer PPI Group. The Skype programme was found to be reliable with minimal technical interference. Cost analysis suggests Skype clinics will generate revenue and run at 1.6% of outpatient clinic costs. Nine of 32 eligible patients (28%) have been recruited to date. Preliminary data will be presented.

**Conclusions:** We have identified patient-directed interest in telemedicine follow-up. Skype clinics are reliable and cost-efficient, necessitating only a fraction of outpatient clinic costs. Patients' participation is reduced by technology.

## Breast Endocrine

### Audit and Outcomes Research 0031

#### Patient Expectations in Day Surgery Unit

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**Aims:** To elucidate patient expectations in day surgery unit in a district general hospital.

**Methods:** A cross-sectional, observational, quality-improvement study where all consenting adult patients in the elective day surgery department were invited to complete a 20-item anonymous questionnaire prior to their consultation. The questionnaires were handed out in the day surgery unit for a 6 week period to elective preoperative otolaryngology patients attending to undergo surgery. A variety of outcomes were assessed including; patient demographics, communication and administration, consent, patient expectation of surgeons and waiting time.

**Results:** Two-hundred and twenty patients were surveyed with 203 patients completing the survey resulting in a 92% response rate. All responses were analysed in accordance to gender, age and prior surgery. There was a statistically significant difference in the importance of seniority, with females rating its importance higher ( $p < 0.05$ ). There was a statistically significant difference in who was expected to do the surgery ( $p = 0.00001$ ) with older patients expecting a consultant only or an unsupervised surgeon alone more often than patients with an age below the mean, who expected consultants or supervised/unsupervised surgeons. There were statistically significant differences in who patients expected to see ( $p = 0.0013$ ) with those having had previous surgery expecting to see the consultant only, while those without previous surgery expected a supervised surgeon or unsupervised surgeon only more commonly. There was a statistically significant difference in the length of the consent process ( $p = 0.049$ ), the importance of seniority ( $p = 0.05$ ) and seeing the same clinician ( $p = 0.005$ ), asking to see the consultant ( $p = 0.05$ ), the acceptable waiting time ( $p = 0.03$ ) alongside who they expected to do the surgery ( $p = 0.03$ ).

**Conclusions:** Most patients' expectations are not difficult to meet and centre on meeting service and administrative factors alongside education/training for surgeons and patients. The key lesson for clinicians is to communicate openly with patients, eliciting and managing expectations

### Audit and Outcomes Research 0064

#### Post Splenectomy Vaccination and Prophylaxis in a General Hospital: a Persistent Failure to Meet Standard

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**Aims:** In order to reduce the risk of overwhelming postsplenectomy sepsis (OPSS), asplenic patients should be vaccinated with polyvalent pneumococcal vaccine (PPV), haemophilus influenza serotype B conjugate (HiB) and meningococcal group C conjugate (MenC) prior to discharge. The British Committee for Standards in Haematology (BCSH) recommend administration of vaccines 2 weeks post-operatively. The aim of our study was to compare current practice against BCSH guidelines.

**Methods:** A retrospective analysis of patients that underwent emergency/urgent splenectomy between May 2003 to April 2014 was undertaken. Electronic and physical records were collected and case management was compared with a modified proforma supplied by the BCSH. A literature review was conducted to assess the evidence behind the BCSH guidelines. Local guidelines were produced based on the evidence found.

**Results:** 71 patients underwent splenectomy, 5 were excluded due to early mortality. Of 66 survivors, 42 were male, median age 53 [range 12–89], median length of stay (LOS) 10 days [range 3–93]. 56% patients received PPV during admission, 58% and 55% patients received HiB conjugate vaccine and MenC respectively. 88% high risk patients received lifelong prophylactic antibiotics,

95% received emergency antibiotics. Identification of 'high risk' patients was poor (3%).

**Conclusions:** Our study has highlighted failures in documentation and/or administration of post-splenectomy vaccination for emergency splenectomy patients. Current guidelines are not being followed and patients are being put at risk.

### Breast/Endocrine 0069

#### Improving post operative pain management in subpectoral tissue expander implant reconstruction of the breast using an elastomeric pump

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**Aims:** Postoperative pain after breast surgery is one of the major factors contributing to delay in mobilization and prolonged hospital stay. We performed a retrospective analysis of patients undergoing skin-sparing mastectomy and insertion of a subpectoral implant. The aim was to determine whether the use of an elastomeric local anaesthetic pump improved pain control and length of stay (LOS).

**Methods:** 25 consecutive patients undergoing skin-sparing mastectomy and insertion of a subpectoral implant were sited with an elastomeric local anaesthetic infusion pump intra-operatively, in addition to standard regular and PRN analgesia. The control group contained 25 patients undergoing the same procedure who received standard analgesia alone. Visual Analogue Scales (VAS) were recorded at 24 hours, as was any further PRN analgesic requirement.

**Results:** Median age was 51 (range 26–75) in the intervention group and 50 (range 28–70) in the control. Mean VAS score was 0.28 (0.61SD) at 24 hours in the intervention group and 1.84 (0.37SD) in the control group,  $< 0.0001$ . Mean LOS was 1.8 days (0.71 SD), and 2.28 days (0.94 SD) in the control group,  $p = 0.252$ . There were no complications involving catheter placement, leakage or toxicity relating to use of the local anaesthetic.

**Conclusions:** We have found significantly reduced pain with the use of the local anaesthetic infusion pump and a trend towards reduced length of stay. The elastomeric pump is a step towards enhanced patient recovery after breast surgery in the case of skin sparing mastectomy and subpectoral tissue expander reconstruction.

### Breast/Endocrine 0075

#### Imaging in the over 75's attending symptomatic breast clinics: Does everyone need a mammogram?

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**Aims:** Mammography is performed in all symptomatic female breast referrals aged 40 years and over. If there is no palpable abnormality (P1) imaging is still performed which is effectively screening. Unlike the screening programme, there is no upper age limit for imaging these patients. The aim of this audit is to establish whether putting an upper limit of 75 years of age for patients with no clinical abnormality could have a detrimental effect on their care.

**Methods:** Patients aged 75 years and over attending the symptomatic breast clinic were identified. Data was collected prospectively from three centres over a one year period (01/08/2012 to 31/07/13).

**Results:** 217 patients were identified (all female, mean age 81 years). 61 patients were found to have no abnormality (P1). 56 of these underwent imaging, of which 3 patients were found to have invasive malignancy. 1 patient underwent surgical resection followed by endocrine therapy, the remaining 2 patients

went onto have primary endocrine therapy. The remaining 5 patients were either too frail, or did not cooperate with imaging and underwent no further investigation or treatment. Overall, 73 patients were found to have invasive malignancy following clinical and/or radiological suspicion. 63 of these patients were evaluated as P4 or P5 clinically.

**Conclusions:** The identification of treatable malignancy following P1 assessment confirms that placing an upper age limit for imaging patients over the age of 75 years attending symptomatic breast clinic and found to have no clinical abnormality could have a detrimental effect on the care of this group.

## Breast/Endocrine 0179

### The benefit of the multidisciplinary team (MDT) in locating the elusive parathyroid adenoma in primary hyperparathyroidism (PHPT)

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**Aims:** The surgical treatment of PHPT is greatly simplified by the preoperative localisation of the usual single adenoma. This study has assessed the influence of an endocrine MDT upon the operative strategy and surgical cure rates achieved.

**Methods:** From 2004–2012 all patients referred for surgical treatment of PHPT underwent preoperative technetium sestamibi and ultrasound imaging. Those with concordant positive imaging underwent a mini-incision focussed approach while the remainder had a 4-gland parathyroid exploration. From March 2012 all patients with negative or equivocal imaging were presented to an endocrine MDT, and underwent further investigations in an attempt to locate the elusive adenoma. Surgical cure was defined as normocalcaemia 3 months following parathyroidectomy.

**Results:** Prior to the MDT 120 patients underwent parathyroidectomy with 89 (74%) patients treated with a focussed single gland excision, and the remainder (31 patients, 26%) undergoing a 4-gland exploration. The primary and secondary cure rates were 93 and 96% respectively.

From March 2012, 61 patients have had surgery, of which 42 (69%) had positive ultrasound and sestamibi imaging, and underwent a focused operation. The remaining 19 patients (31%) were presented to the MDT, and underwent further imaging that included computed tomography (12 cases) and venous sampling (10 cases). A single adenoma was identified in an additional 16 patients (2 had mediastinal glands). Focused surgery was performed in 58 patients (95%) and 60 of 61 (98%) patients have been cured following the primary procedure.

**Conclusions:** The parathyroid MDT has significantly increased the number of focused operations, and has improved operative cure rates. In particular, 2 mediastinal adenomas were identified which would have undoubtedly been missed with a conventional neck exploration.

## Breast/Endocrine 0190

### 'One-Stop' Thyroid Clinic - The Way Forward?

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**Aims:** Most thyroid nodules, especially clinically solitary nodules and dominant nodules in multinodular goitres require ultrasound (US) assessment and may also require fine needle aspiration cytology (FNAC). In the usual outpatient setting patients make multiple hospital visits. We set up a joint thyroid clinic with a consultant surgeon and consultant radiologist to offer 'triple assessment' on a single visit and audited its performance.

**Methods:** We reviewed 228 new referrals seen in this newly established clinic from Sept 2011 to Dec 2013.

**Results:** Among 228 patients, 183 were referred with a history of a neck lump and others with a multitude of complaints. 163 patients underwent US on the same visit and 66 FNACs (57 under US guidance) were performed. Patients were informed of the US results on the day and FNAC results by letter. 198 (87%) patients only made a single visit to the clinic for diagnosis. 125 were discharged

/ referred elsewhere after the visit, 21 underwent surgery and the others were followed up. There were 7 thyroid cancers and 2 lymphomas.

**Conclusions:** A joint clinic by surgeon and radiologist provides a very effective outpatient thyroid service and improves patient experience. The majority of patients can be diagnosed on a single visit and most can be discharged following the assessment.

## Breast/Endocrine 0206

### The Need for Core Outcome Reporting in Autologous Fat Grafting for Breast Reconstruction

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**Aims:** There is growing interest in autologous fat grafting (AFG) for breast reconstruction. This systematic review examines the range of outcomes used across studies of AFG, their definitions and whether there is a need for a core outcome set to aid reporting.

**Methods:** Following the protocol of our previous systematic review, a search of 20 databases (1986 to March 2014) returned 35 studies which met the inclusion criteria for our systematic review. These were assessed independently by two authors. Disagreements were resolved by consensus.

**Results:** Of 35 studies, 27 (77%) were case series, 5 (14.3%) were cohort studies and 3 (8.6%) were case reports. A total of 51 different outcomes were reported. These studies each reported a median of 5 separate outcomes (range 2–14), of which a median of 3 outcomes were defined (range 0–14). A median of 2 outcomes per paper were pre-specified in the study methods (range 0–12) and a median of only 2 outcomes per paper (range 0–12) were both defined and pre-specified. The most commonly reported outcome in studies of AFG was that of 'Operative details', reported by 26 studies, and 8 different outcome definitions were used. 'Cancer recurrence' was reported by 20 studies, with the use of 10 different outcome definitions. Overall, there was a poor proportion of defined and pre-specified outcomes that employed a wide range of different outcome definitions.

**Conclusions:** There is a need for a core outcomes set for autologous fat grafting to minimise outcome and reporting bias and aid evidence synthesis.

## Cancer/Surgical Oncology (GI) 0216

### Outcomes Following Multivisceral Resection of Retroperitoneal Sarcomas

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**Aims:** Retroperitoneal sarcomas (RPS) are rare malignant tumours developing in an anatomically complex space surrounded by normal viscera and vital structures. Multivisceral resection of RPS with involved contiguous organs as a single specimen has been shown to improve oncological outcomes, but is not universally practiced with some units concerned it increases morbidity compared with limited resections. We present the experience of a high volume sarcoma centre.

**Methods:** Patients undergoing potentially curative resection of RPS from January 2005 to August 2014 were identified from a prospectively maintained database. Electronic patient records were scrutinized to determine tumour characteristics, 30-day mortality and morbidity, and oncological outcomes.

**Results:** A total of 385 resections were performed. The median age was 61 yrs, M:F ratio of 1.2:1. Median tumour size and weight were 22 cm and 3383 g, respectively. Tumour grade was 1 in 31%, 2 in 45%, and 3 in 24%. Contiguous organs were resected in 308 resections, with the most common being colon (49.6%), kidney (47.5%), spleen (15.6%) and pancreas (11.9%). 30-day mortality rate was 1.6%. Overall 30-day morbidity was 18.1%. Following intestinal anastomosis (195 cases), the anastomotic leak rate was 2.1%. In

those with follow-up renal function post-nephrectomy (112 cases), 100 had normal renal function (CKD class 1 or 2). Of these, 50% maintained their CKD class post-operatively with 48%, 1% and 1% progressing to class 3, 4 and 5 respectively. The remaining 12 had CKD class 3 and did not change class post-operatively. None required long-term renal replacement therapy.

Complete macroscopic resection (R0/R1) was performed in 95% of cases. At a follow-up of 5 years, the local recurrence rate was 54.5%. Disease-free and overall survival were 45% and 68%, respectively.

**Conclusions:** Multivisceral resection can be performed safely in a high volume centre, with low morbidity and mortality and is associated with improved disease-free and overall survival compared to limited resection.

## Audit and Outcomes Research 0237

### Ultrasound Guided Assessment of Thyroid Nodules as per BTA Guidelines: our Experience at The Royal London Hospital

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**Aims:** To establish whether the new BTA guidelines are being implemented at our teaching hospital.

Over the last few years there has been a large body of evidence to suggest that USS is highly sensitive at detecting suspicious features on thyroid nodules that can improve decision making for FNA. By substituting the older 2007 BTA guidelines for the new 2014, fewer unnecessary repeat scans and FNAs would need to be performed, thus incurring a huge cost saving to the Trust and NHS as a whole.

**Methods:** 3 month search of all 'USS Thyroids' performed using PACS system since the publication of the guideline (July 2014).

**Results:** 850 USS neck performed, of which 132 'USS Thyroids' performed between July and September 2014. 62% scans were reported by 'Head and Neck' Radiologists. Most common indication for USS was palpable goitre (32) and previous pathology on USS (38). Only 2/132 scan reports showed strict compliance with BTA guideline, 27 scan did not report any corresponding thyroid features, 28 scans did not mention cervical lymph nodes and 7 scans did not mention any nodes or thyroid features. Only 7 USS reported 'suspicious features' and all unplanned FNAs were performed by 'Head and Neck' Radiologists. 6/7 FNAs showed significant pathology Thy5 (2), Thy3f (1), Thy3a (1), Thy1 (2).

**Conclusions:** There was no standardised reporting system amongst radiology reporters. The audit demonstrates that the Head and Neck radiologists are most adherent to current BTA guideline. Overall, there is evidence of poor knowledge and understanding of guideline and the following recommendation have been proposed: - Interventional poster of U classification to be made available in reporting rooms - Local departmental teaching (thyroid and head and neck MDT's) - Re-audit January-March 2015.

## General 0295

### When do Surgical Patients Want to Receive Information and Provide Consent for Their Procedure?

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**Aims:** Informed consent for elective surgery has evolved as our understanding of the quantity and quality of information required in this process has improved. Surprisingly, the timing of when this information should be delivered has rarely been explored. We investigated when patients preferred to receive information and give consent for their procedure and also determine whether their needs were met.

**Methods:** All patient undergoing day-case surgery at a District General Hospital over 6 weeks completed a simple questionnaire detailing their experiences of the informed consent process and their preferences.

**Results:** Ninety-five patients were studied. Their mean age was 50 (range 16–90) years and 50 (53%) were female. The surgical procedures included hernia repairs (24, 25%), intermediate breast surgery (16, 17%) and varicose vein surgery (12, 13%). Most patient (44, 46%) wanted to receive information when they saw the specialist in the outpatient clinic. This was consistent with our current practice (48, 51%). Other patients preferred to receive information at the pre-operative assessment clinic (17, 18%), on the day of surgery (16, 17%) or at the GP practice prior to referral (13, 14%). As to the timing of obtaining written consent, 62 (65%) preferred this to be done on the day of surgery. Seventy-eight (82%) gave their consent at this time.

**Conclusions:** Patients preferred to receive information about their proposed surgery when they saw the specialist in the outpatient clinic and wanted to sign their consent form on the day of surgery. Our current practice was in keeping with this.

## Breast/Endocrine 0304

### Attitudes towards breast conservation in patients aged over 70 with breast cancer

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**Aims:** Investigate the attitudes of patients aged 70 and over towards breast conserving surgery (BCS) and factors which may influence their treatment decisions.

**Methods:** A questionnaire was sent to patients aged 70 and over at the time of breast cancer surgery between 1999 and 2013. This detailed surgical options and recommendations, treatment expectations, and other factors which may have influenced any decision made e.g. travel for radiotherapy, potential side effects.

**Results:** Responses were received from 339 patients, 192 of whom had a mastectomy, the remaining undergoing BCS. Eighty-six percent of the mastectomy group said that their surgeon had recommended this as the best surgical option, this was identical in those having BCS. In the mastectomy group 18% would have preferred BCS had it been an option, with 40% of this group willing to take neoadjuvant endocrine therapy to facilitate this. However, only 14% would have considered neoadjuvant chemotherapy with the same aim. Forty-three percent of mastectomy patients factored the risk of local recurrence into their treatment decision. Only 15% of patients were put off BCS by the commute required to attend for radiotherapy.

Within the BCS group, 28% reported no side effects from radiotherapy. Despite our patients having to travel a considerable distance daily for radiotherapy, only 4% found it problematic. Eighty-eight percent of patients who had BCS said they were happy with their treatment decision, with 72% being happy or very happy with their cosmetic outcome.

**Conclusions:** BCS is something that patients aged 70 are interested in considering. More than a third of patients requiring mastectomy would be willing to take neoadjuvant endocrine therapy to facilitate BCS. Although some patients were put off by the requirement for post-operative radiotherapy the majority did not consider this to be a problem.

## Breast/Endocrine 0305

### Breast cancer presentation in the over 70s

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**Aims:** Older patients with breast cancer generally present later with more advanced disease for a variety of factors. We aimed to explore the presentation of the over 70s with breast cancer, along with their attitudes towards screening.

**Methods:** A questionnaire was sent to patients aged 70 and over at the time of their breast cancer diagnosis. This detailed reasons and timing of presentation, in addition to thoughts about screening.

**Results:** Three hundred and fifty-two questionnaires were sent to women with a mean age of 76, 230 were returned (65%).

64% routinely examined their breasts with more identifying a lump themselves (70%). Distressingly only 36% of these patients were aware of the other signs/symptoms of breast cancer.

The majority of women sought medical attention early after identifying a problem, with 39% seeing someone within days and only 6% waiting over 6 months. Personal concern was the greatest prompt for women to see a doctor (68%) followed by family or friend concern (10%).

With regard to screening, 83% routinely attended screening when they were invited. Ninety percent also said they would attend if the service was routinely offered to the over 70s. Although the majority (60%) were not aware that they could opt into the screening service once over 70.

**Conclusions:** Despite the belief that most older women are felt to be less breast aware than younger most of our patients routinely examined themselves and identified the pathology, before promptly seeking medical advice (70% within weeks). This is the case despite most women having no knowledge of other signs and symptoms of breast cancer. Our cohort have also shown that they are keen to continue screening over the age of 70 if it was routinely offered.

### Cancer/Surgical Oncology (Other) 0307

#### Outcomes Following Extended Surgery for Retroperitoneal Sarcomas: Results From a UK Referral Centre

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**Aims:** Primary extended resection has been proposed as the initial treatment for patients with retroperitoneal sarcoma. This approach comprises an extended en-bloc resection of the directly infiltrated organs and adjacent uninvolved organs. The results of such radical surgery have yet to be validated. This retrospective study aims to investigate this practice in a contemporary series from a referral centre in the UK.

**Methods:** Data from consecutive patients who underwent extended resectional surgery between 2009 and 2013 and investigated the type of resection performed, the effectiveness of extended surgery in providing negative microscopic margins, and the occurrence of post-surgical adverse events.

**Results:** 69 patients were included. Fifty-two patients had a primary tumour (75.4%). In 55 patients (79.7%) the tumour was resected en bloc with adjacent organs or structures. Colonic resection (N = 35, 50.7%) and nephrectomy (N = 28, 40.6%) were the most frequently performed organ resection. Organs were infiltrated in 22 patients (32%) and there was no association between organ infiltration and patient variables and staging characteristics. Negative microscopic margins were achieved in 88.6% of patients in this series. Post-operative complications occurred in 21 patients (30%) and a reoperation was required in 10 cases (14.5%). No independent predictors of morbidity were identified and no 30-day post-operative deaths occurred.

**Conclusions:** Four-fifth of patients in this series have organs removed in association with the retroperitoneal sarcoma. This approach in a specialist sarcoma unit results in negative microscopic tumour margins in up to 90% of the cases and can be performed safely

### Audit and Outcomes Research 0308

#### Pre-Operative Psychological Interventions for Patients Undergoing Surgery for Cancer

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**Aims:** Cancer patients experience anxiety and depression symptoms following diagnosis and during treatment. A wide range of psychological interventions have been proposed to alleviate their distress, but the evidence about their effectiveness in the perioperative period is not clear. This systematic review examined the effect of preoperative psychological interventions on the post-operative outcomes of patients undergoing surgery for cancer.

**Methods:** A systematic review of the published data was performed using Embase, Medline and PsycInfo for the period from 1946 to February 2014. A total of 951 publications (case series, single case reports and reviews) were found, of which only 7 studies included patients undergoing an operation for cancer and a preoperative psychological intervention.

**Results:** Six of seven studies were randomized controlled trials. Four were conducted in patients with breast cancer (N = 356). The other studies included patients with gynaecological cancer (N = 30), colorectal cancer (N = 60) and prostate cancer (N = 159). Four studies were assessed to be good quality, two moderate and one poor quality. Interventions did not have an impact on 'traditional' surgical outcomes such as length of hospital stay, complications, analgesia use or mortality, but positively affected patients' immunological function. However, psychological interventions appeared to impact patients reported outcome measures including psychological outcomes, quality of life and somatic symptoms.

**Conclusions:** Available data suggested that pre-operative psychological interventions may have a role in cancer patients undergoing surgery. However, further evidence is needed to evaluate their role.

### Cancer/Surgical Oncology (Other) 0366

#### Factors associated with patients in the Scottish Highlands who chose mastectomy when suitable for breast conservation.

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**Aims:** Introduction: A number of women chose to undergo mastectomy (MX) despite being suitable to breast conserving surgery (BCS). This study aimed to assess the pre-operative pathological and geographic factors associated with choosing MX rather than BCS in a single centre that serves a large geographical area encompassing urban, rural and remote island populations.

**Methods:** A retrospective analysis of all patients suitable for BCS diagnosed between January 2011 and December 2013 was undertaken. Patient who chose MX were identified from the electronic patient record. Pre-operative pathological features were compared using the Pearson chi squared test as were the Scottish Index of Multiple Deprivation score and the distance to the treatment centre from the patient's home.

**Results:** 446 patients suitable for BCS were identified of which 46 (11%) chose to undergo MX. Patients choosing MX were more likely to present symptomatically (29 patients, 63% vs 170 patients, 42%, p = 0.009). MX patients were more likely to have tumours larger than 20 mm at diagnostic imaging (27 patients, 59% vs 106 patients, 26%, p = 0.001) and positive pre-operative axillary staging (12 patients, 26% vs 45 patients, 11%, p = 0.004). Patients choosing MX lived more remotely from the treatment centre with 9(19%) patients living 100 miles or more away vs 58(14%) patients and 10(22%) patients living within remote island populations vs 33(9%) of BCS patients, however this just failed to reach statistical significance, p = 0.051. There was no association with social deprivation as represented by the Scottish Index of Multiple Deprivation score.

**Conclusions:** Symptomatic presentation and the adverse pathological features of larger tumour size and positive pre-operative axillary staging were associated with patients choosing MX rather than BCS. There was also a trend for MX patients to live remotely from the treatment centre. Further study that will investigate how these factors influenced the patient's choice of MX will now be undertaken.

### Breast/Endocrine 0380

#### Axillary staging in breast cancer: improvements in pre-operative ultrasound evaluation

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**Aims:** Axillary assessment forms an essential component of breast cancer staging. NICE Guidelines (2009) advised that pre-treatment ultrasound evaluation of the axilla should be performed for all patients under investigation

for early invasive breast cancer and if morphologically abnormal nodes identified, ultrasound-guided needle sampling should be offered. Pre-operative assessment of the axilla has become standard practice at this unit since 2010. The aim was to review all axillary assessments since 2010 to establish whether pre-operative diagnosis of axillary metastases has changed.

**Methods:** Data was collected on axillary procedures in the breast care unit at a busy district general hospital in south-west England with three lead surgeons. Data was collected in four audit cycles each lasting one year from April 2010. All axillary procedures in breast cancer patients between April 2010 and February 2014 were identified using consultant databases, histopathology records and theatre diaries.

**Results:** 987 cases were identified. 279 patients were diagnosed with malignancy in the axilla with 101 patients diagnosed pre-operatively. Patients receiving neo-adjuvant chemotherapy were excluded. The number of patients with malignancy in the axilla diagnosed pre-operatively as opposed to using sentinel node biopsy has increased year on year (21% in 2010–11; 37% in 2011–12; 48% in 2012–13 and 51% in 2013–14).

**Conclusions:** Over time, there has been a significant trend towards diagnosing axillary malignancy pre-operatively over intra-operatively on sentinel node biopsy. This suggests a learning curve in the use of axillary ultrasound and node sampling in the unit, improving adherence with NICE Guidelines.

## Breast/Endocrine 0464

### Exploring variations in the provision and practice of implant-based breast reconstruction in the UK: Initial results from the iBRA National Practice Questionnaire

on behalf of the Breast Reconstruction Research Collaborative<sup>1\*</sup>

<sup>1</sup>*Breast Reconstruction Research Collaborative, United Kingdom, United Kingdom*

**Aims:** The introduction of lower-pole sling procedures has revolutionised the practice of implant-based breast reconstruction (IBBR), but data regarding the availability and practice of these procedures across the UK is limited.

The iBRA (implant Breast Reconstruction evaluation) study is a trainee-led national prospective audit that aims to explore the practice and outcomes of IBBR to inform the feasibility of undertaking a randomised trial comparing novel techniques.

We report the early results of the first phase of the iBRA Study, a National Practice Questionnaire (NPQ) which aims to comprehensively describe current national practice.

**Methods:** A questionnaire developed by the iBRA Steering Group was completed by trainee and consultant leads at breast and plastic surgical units across the UK. Simple summary statistics were calculated for each survey item to evaluate variations in service provision, practice and adherence to guidelines.

**Results:** To date, 44 units have completed the NPQ. Variation was demonstrated in the provision of novel techniques for IBBR especially the availability of biological (n = 32, 72.7%) and synthetic (n = 10, 20.5%) meshes and in patient selection criteria for these procedures. There was lack of consistency in peri and post-operative management particularly duration of antibiotic use (induction only vs. 14 day course) and drain policy (no drains vs. 2 drains for 14 days), but use of infection control measures such as laminar flow theatres (n = 8, 18.2% all cases); glove changes (n = 36, 81.8%) and cavity irrigation (n = 29, 65.9%) were also highly variable. Few units (n = 14, 37.8%) had written management protocols or guidelines and only half of units (n = 20) prospectively audited their outcomes.

**Conclusions:** Early analysis of the iBRA NPQ has demonstrated marked variation in the provision and practice of IBBR. The prospective audit phase of the iBRA study will determine the safety and efficacy of different approaches to IBBR and allow evidence-based best practice to be explored.

## Breast/Endocrine 0465

### Exploring the potential of using the trainee collaborative model to deliver high-quality, large-scale prospective multicentre studies in reconstructive breast surgery: The iBRA (implant Breast Reconstruction evaluation) study

On behalf of the Breast Reconstruction Research Collaborative<sup>1\*</sup>

<sup>1</sup>*Breast Reconstruction Research Collaborative, United Kingdom, United Kingdom*

**Aims:** The introduction of techniques to augment the subpectoral pocket has revolutionised the practice of implant-based breast reconstruction (IBBR), but evidence to support the safety and efficacy of these techniques is lacking. High-quality data are required, but large prospective cohort studies are expensive and time-consuming to run. Adoption of the trainee research collaborative model may effectively overcome these barriers.

We report early experience with the iBRA (implant Breast Reconstruction evaluation) study which has employed this innovative methodology in breast surgery for the first time.

**Methods:** The iBRA study has 4 phases that aim to inform the feasibility and conduct of a future RCT:

Phase 1-A national practice questionnaire (NPQ) to define current practice

Phase 2-A prospective audit of consecutive patients undergoing IBBR to explore the clinical and patient-reported outcomes of surgery

Phase 3-An IBBR-RCT acceptability survey to explore patients' and surgeons' views of proposed trial designs.

Phase 4-Design of the definitive RCT.

Trainee leads have been identified at each centre via the Mammary Fold and Reconstructive Surgery Trials Network. Leads are responsible for completing the NPQ with the support of a lead consultant and identifying patients for the prospective audit, collecting in-hospital and 30-day outcome data and obtaining consent for patient-reported outcome questionnaires. Any individual recruiting 10 or more patients becomes a PUBMED citable collaborator on all resultant publications.

**Results:** Between May and Dec 2014, 90 units have agreed to participate and 67 have contributed to the NPQ. Over 100 collaborators have recruited 328 patients from 35 centres and the study is running 6-months ahead of schedule (figure 1).

**Conclusions:** The iBRA study has demonstrated that the trainee collaborative model is an effective means delivering large-scale prospective studies in breast surgery. Trainee engagement may be the future of high-quality surgical research.

## Audit and Outcomes Research 0499

### Breast cancer awareness month: Is it a waste of time?

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**Aims:** Breast cancer awareness month (BCAM) is an annual international health campaign every October to increase awareness of the disease. We aimed to assess breast cancer risk awareness amongst hospital staff with relevance to BCAM.

**Methods:** A short questionnaire of fifteen possible risk factors for breast cancer was given to the hospital staff nurses. They were asked to recognise these risk factors as yes/no/do not know. The survey was carried out in two phases; phase 1 was Pre-BCAM, in the month of September and the phase 2 was Post-BCAM, in the month of November.

**Results:** A total of 73 hospital staff nurses were surveyed, 34 in September 2012 and 39 in November 2012. A 100% response rate was observed. Median correct response rate was 50% in Sep and 46% in Nov with no statistically significant difference (p = 0.64) between the two months.

A 33% increase in total 'yes' responses was observed in Nov (n = 320) compared with Sep (n = 241). This increase in 'yes' responses in Nov was similar for correct (37%) and incorrect (27%) replies with no statistical difference between the two (p = 0.089).

**Conclusions:** BCAM failed to increase hospital staff's awareness of breast cancer risk factors, paradoxically a decrease in risk recognition was observed

after the BCAM. Stronger strategies than just naming a month for breast cancer are required to enhance public knowledge of the disease.

## Cancer/Surgical Oncology (GI) 0531

### Extra-thoracic Solitary Fibrous Tumours (SFTs): a European Prognostic Study

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**Aims:** Extra-thoracic SFT is a rare sarcoma histotype curable with surgery in 80–90% of patients. It is still not possible to accurately predict prognosis prior to surgery, however, and these tumours range from relatively indolent to highly malignant metastasising lesions. We have investigated a multi-centre series to formulate a proposal to stratify the risk to patients with SFTs.

**Methods:** We analysed 243 patients with SFTs who underwent surgery between 2001 and 2011 from four major European referral units. Multivariate survival analysis was used to identify prognostic factors for disease-free and overall survival (DFS and OS).

**Results:** After a median follow-up of 37 months (range, 22–72), 45 patients (18%) had a recurrence and 37 (15%) died because of their tumour. The presence of cellular atypia, necrosis and high mitotic rate were all associated with both DFS and OS. We did not identify DFS and OS differences between the so called classical and sarcoma-like morphology. Surgical margins were a significant prognostic factor for DFS but not for OS. Finally we have identified a paradoxical effect for tumour size as larger tumours were associated with a better prognosis and fewer recurrences.

**Conclusions:** We have formulated a prognostic model to stage SFTs patients.

## Audit and Outcomes Research 0064

### Post Splenectomy Vaccination and Prophylaxis in a General Hospital: a Persistent Failure to Meet Standard

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**Aims:** In order to reduce the risk of overwhelming postsplenectomy sepsis (OPSS), asplenic patients should be vaccinated with polyvalent pneumococcal vaccine (PPV), haemophilus influenza serotype B conjugate (HiB) and meningococcal group C conjugate (MenC) prior to discharge. The British Committee for Standards in Haematology (BCSH) recommend administration of vaccines 2 weeks post-operatively. The aim of our study was to compare current practice against BCSH guidelines.

**Methods:** A retrospective analysis of patients that underwent emergency/urgent splenectomy between May 2003 to April 2014 was undertaken. Electronic and physical records were collected and case management was compared with a modified proforma supplied by the BCSH. A literature review was conducted to assess the evidence behind the BCSH guidelines. Local guidelines were produced based on the evidence found.

**Results:** 71 patients underwent splenectomy, 5 were excluded due to early mortality. Of 66 survivors, 42 were male, median age 53 [range 12–89], median length of stay (LOS) 10 days [range 3–93]. 56% patients received PPV during admission, 58% and 55% patients received HiB conjugate vaccine and MenC respectively. 88% high risk patients received lifelong prophylactic antibiotics, 95% received emergency antibiotics. Identification of 'high risk' patients was poor (3%).

**Conclusions:** Our study has highlighted failures in documentation and/or administration of post-splenectomy vaccination for emergency splenectomy patients. Current guidelines are not being followed and patients are being put at risk.

## Audit and Outcomes Research 0538

### Development of an Advanced, Timeline Structured Breast Cancer Data System With Wide Generic Application for Multidisciplinary Decision Assistance and Research

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**Aims:** It is particularly difficult to achieve real understanding of the relationships between pathology, multidisciplinary treatments, long term progression and ultimate outcome in complex, heterogenous real world populations with a chronic disease such as breast cancer; or to compare outcomes between one treatment era and another. We aimed to build a comprehensive, continuously accruing data system for the study of all breast cancers presenting to a long established specialist regional centre for the treatment of breast cancer.

**Methods:** Using a design, test and adjust methodology, we have built (in house and at minimal cost) an integrated, graphically rich, timeline structured data system in which the disease progression to final outcome of each and every patient treated at the centre since the 1970s is mapped on a 'LifeTrak'. The episodes and month/year of primary diagnosis, of recurrence, of the detection of metastases and the time and cause of death (where appropriate) are plotted and recorded. An integral timeline EPR allows immediate access to an integral evidence base of documents, results and reports.

An integral data mining system allows analysis, comparison and direct visualisation of intervals and outcomes for a wide range of variables and cohorts.

**Results:** As of January 2015, 12,000+ locally diagnosed and surgically treated cases have accrued to the system, along with 4,500+ cases referred from other hospitals for adjuvant therapy. Complex patterns of disease progression have been visualised and quantified in more than 30,000 episodes of care.

**Conclusions:** A dynamic, integrated, timeline and episode structured data system for entire populations of patients with breast cancer and other chronic diseases of child and adulthood transforms the conceptual base from the 'here and now' to the 'whole patient journey' perspective. The research, data mining, MDT and Clinical Decision Assistance applications of this new system are considerable.

## Breast/Endocrine 0585

### Neck exploration for primary hyperparathyroidism; is the Sestamibi scan required?

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**Aims:** Surgical treatment for primary hyperparathyroidism (pHPT) involves either a neck exploration or selective parathyroidectomy; the latter requiring definitive imaging. We aimed to determine the influence of ultrasound scans (USS), Sestamibi SPECT-CT scans (SestSCT) and peri-operative macroscopic diagnosis by the senior surgeon in order to determine our management pathway in a non-tertiary centre with no on-site access to SestSCT.

**Methods:** We retrospectively determined patients having a neck exploration for pHPT from Jan 2009 to May 2014 by a single surgeon using electronic theater coding, and collected clinicopathological, radiological and peri-operative documented data. Sensitivity and specificity were calculated with the gold-standard comparator being the histopathological diagnosis of adenoma/carcinoma of the resected parathyroid gland.

**Results:** Of the 123 patients who had neck exploration for pHPT during the study period, 111 patients had an USS, of which 75 also had SestSCT. Only 10 patients had SestSCT alone (data missing, n=2). 54/111 USS and 8/85 SestSCT were inconclusive. There was good concordance between USS and SestSCT (p=0.022); when an adenoma was definitively found on USS (n=22), SestSCT concurred. However, in those that had a negative USS (n=22), SestSCT found adenomas in 11 patients. SestSCT gave definitive diagnoses in 29/33 inconclusive USS. USS and SestSCT had a sensitivity of 58% and 79% respectively and a specificity of 78% and 50% respectively. PPV for both USS and SestSCT was 93%. Macroscopic diagnosis by the surgeon had a sensitivity of 100% and a specificity of 54%.

**Conclusions:** Neck exploration to isolate adenomas can successfully be performed without SestSCT in the event of a definitive USS (high specificity) and macroscopic diagnosis of an adenoma by an experienced surgeon (high sensitivity). In the event of a normal USS in patients with pHPT, a SestSCT would be required prior to neck exploration, to improve the sensitivity of the radiological information required for decision-making.

## Breast/Endocrine 0678

### ZOO 11 trial: Does it influence our clinical practice in U.K.

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**Aims:** Sentinel lymph node (SLN) biopsy is the current standard of care for the staging of breast cancer patients and axillary lymph node dissection is reserved for patients with nodal macrometastases (> 2.0 mm) in our practice. However the ACOSOG Z0011 trial showed that axillary lymph node dissection could be spared in certain groups of patients with positive sentinel node disease. This study has been considered as a practice changing trial and our aim is to assess the impact of this trial in our clinical practice by applying its criteria to our cohort of patients.

**Methods:** All female patients diagnosed with invasive breast cancer between April 2009 and March 2013 was included in the study. Patients were considered eligible if they met ACOSOG Z0011 criteria. Demographics, Tumour characteristics, Grading and Receptor status of the patients who underwent completion ALND were then assessed.

**Results:** Of the 1499 women diagnosed with invasive breast cancer from 2009 to 2013, 918 patients (61.2%) underwent Sentinel node biopsy. Of these, only 55 women had axillary nodal metastases with the SNB positivity rate of 6% (55/918). Of the 55 patients, 22 patients were excluded (Eleven patients had mastectomy, six had more than two nodes involved, four had neo adjuvant chemotherapy and one declined completion axillary dissection) leaving 33 patients. Therefore 2.2% (33/1499) of the total cohort met the inclusion criteria for the ACOSOG Z0011 trial.

**Conclusions:** In this observational study, only 2.2% (33/1499) of the patients were identified as per the ZOO11 criteria. This means only a very few number of patients could be spared from axillary lymph node dissection. So clearly it is not a practice changing trial in the axillary surgical management of our cohort of patients.

## Cancer/Surgical Oncology (GI) 0741

### Primary Abdominal Mesothelioma is Rare, Increasing in Incidence and Often Presents to General Surgeons: Presenting Features and Outcomes In 65 Patients Treated by Cytoreductive Surgery Combined With Hyperthermic Intraperitoneal Chemotherapy.

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**Aims:** Primary abdominal mesothelioma is a primary peritoneal neoplasm that is increasing in incidence worldwide. The common histological types are epithelioid, biphasic sarcomatoid and well-differentiated papillary with a multicystic variant. Patients commonly present to General Surgeons and optimal treatment strategies continue to evolve. The best outcomes follow cytoreductive surgery (CRS) combined with hyperthermic intraperitoneal chemotherapy (HIPEC). To document presenting features and outcome in patients with abdominal mesothelioma treated by CRS and HIPEC in a Peritoneal malignancy unit.

**Methods:** 65 patients with abdominal mesothelioma were treated between 1998 and 2013. Demographics, Presentation, Operative procedure and Histopathological subtype were assessed. Disease-free (DFS) and overall-survival (OS) were calculated in those who had complete cytoreduction (CCRS) combined with HIPEC.

**Results:** The median age (range) at diagnosis was 50 years (26–74). 40/65 (61.5%) were female. 52/65 (80%) presented with abdominal symptoms, most commonly pain, abdominal distension or abnormality at imaging. In 13/65

(20%) mesothelioma was found incidentally. Histological subtype was epithelioid in 25 (38%), biphasic in 7 (10.7%), well differentiated papillary in 7 (10.7%) and multicystic in 23 (35.3%). Complete cytoreduction was achieved in all patients with multicystic mesothelioma but in only 13/24 (54%) with epithelioid disease. DFS was significantly greater in patients with multicystic disease when compared with epithelioid (mean 112.4 months versus 41.6 months,  $p=0.001$ ) as was OS (all alive versus 45.0 months,  $p=0.001$ ). Three patients who were thought to have mesothelioma were reclassified following expert pathologist review as 2 peritoneal inclusion cysts and 1 primary serous carcinoma.

**Conclusions:** The results show that selected patients with abdominal mesothelioma benefit from CRS and HIPEC. Due to the complex pathology an expert pathological classification is important because it can impact outcome. The best results are in patients who undergo complete cytoreduction and those with multicystic pathology.

## Breast/Endocrine 0778

### A comparison of two Digital mammography systems at Breast Test Wales - What does it mean for surgeons?

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**Aims:** The Welsh breast screening service converted to wholly digital technology in 2012.

This study aims to compare the performance of the two digital mammography technologies used (Sectra/Philips and Hologic); specifically number, type, size and grade of tumour identified?

**Methods:** A retrospective study of a prospectively collected database of 50,000 consecutive screening episodes; clients aged 49–88 (mean 61.9). All tumours were defined by type, size, grade and invasive or non invasive (DCIS). Performance was analysed for statistically significant differences.

**Results:** 500 cancers were found with no statistical difference in invasive cancer detection nor between ductal or lobular subtypes. Hologic detected 267 tumours, 72 (26.97%) were DCIS (2.88 per 1000), compared to Sectra with 233 cancers overall including 36 (15.45%) DCIS (1.44 per 1000). The difference in DCIS detection was significant  $p < 0.001$  with both showing 53% HNG lesions. There was no significant difference in DCIS size for the two technologies.

**Conclusions:** Hologic and Sectra / Philips seem comparable in terms of invasive cancer detection, with a statistically significant difference in DCIS detection, not reported in previous studies. If this difference is clinically significant we may perform unwarranted surgery on many women.

## Breast/Endocrine 0783

### Low risk breast clinics: an alternative to one-stop clinics for a selected patient group

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**Aims:** Breast Cancer is the leading cause of Female Cancer 1. In Scotland, it accounts for 29% of new female cancers 2 with lifetime risk 11.6% 2. With priority on prompt referral/specialist review, pressure on the Breast Service is high.

We aim to demonstrate that 'Low Risk' Breast Clinics provide a viable alternative to Triple Assessment clinics in selected referrals, and their utilisation is effective in reducing the strain on the breast service.

**Methods:** A Low Risk Clinic without radiology was created, where patients unlikely to have breast cancer were reviewed. Low Risk deemed as 1) Female aged < 35 2) Any symptom other than discreet lump; 3) Male Retrospective data analysis for all attendees (n = 458), March - December 2014. All attendees included. Analysis of age, urgency, symptoms prompting referral, clinical findings, need for imaging/biopsy, diagnosis and outcome were recorded for 458 (100%) of patients. Data was analysed and the efficacy of the clinic was evaluated.

**Results:** Total 458 patients (F = 448 M = 12). 427 (93.23%) fit low risk criteria; 31 (6.77%) did not.

Most common symptom prompting referral: pain (n = 221, 48.25%) (Table 1).

Most common clinical finding: No Abnormality (n = 156, 34.06%) (Table 2).

Most common diagnosis: No abnormality (n = 159, 34.72%) (Table 3).

77 (16.81%) of patients required imaging (Table 4) and 21 (4.59%) Biopsy.

Final Outcome: 384 (83.84%) patients discharged after first appointment, 6 (1.31%) discharged with referral to other speciality, 14 (3.06%) for family history screening, giving total of 404 patients (88.21%) not requiring either triple assessment or further appointment. Only 3 Patients (0.66%) found to have cancer: All did not fit low risk criteria.

**Conclusions:** Low Risk Clinics provide a viable alternative to triple assessment, with high discharge rate at first attendance and low need for imaging/biopsy - despite including inappropriate patients. They allow greater flexibility in clinic timing and can relieve pressure on triple assessment clinics.

## Audit and Outcomes Research 0786

### Adherence to Antibiotic and Vaccination Guidelines in Patients Undergoing Splenectomy: a Five Year Follow Up Study

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**Aims:** Following a splenectomy patients are at increased risk of severe infections. In its most severe form, overwhelming post-splenectomy infection (OPSI) has a mortality rate of up to 80%. The lifetime risk of OPSI in these patients has been estimated at around 1–2%. There is widespread variability in trust guidelines in the UK compared to national recommendations. We present a retrospective audit of adherence to vaccination and antibiotic national guidelines for splenectomised patients.

**Methods:** A retrospective audit of 100 patients who underwent splenectomy (21 emergency, 79 elective), in two teaching hospitals was undertaken over a five-year period. Patients were followed up for five years. Hospital and GP records were reviewed for adherence to pre, intra and postoperative vaccination, thromboprophylactic and antibiotic guidance.

**Results:** 58 male and 42 female patients (range 18–86 years old, mean = 56) were reviewed. Idiopathic thrombocytopenic purpura (ITP) was the most common indication for splenectomy (n = 21). 6 patients died in the immediate post-operative period (3 elective and 3 emergency). 86 patients (91.5%) received their HiB, Men C and pneumococcus vaccinations peri-operatively. 14 patients (8.5%), 12 elective and 2 emergency, did not have a record of their vaccinations having been administered. 81 patients (86%) received post-operative antibiotics. 99% of patients received thromboprophylaxis treatment. 89 patients (95%) were treated with long-term antibiotic prophylaxis. Only 20 patients (23%) had an emergency supply of antibiotics. 95% of patients were administered an annual influenza vaccination and 84% of eligible patients were administered a five-year pneumococcal booster vaccination.

**Conclusions:** This audit has demonstrated an unacceptable variability in the management of patients undergoing splenectomy. Improvement in the management of this patient cohort can be achieved by a multidisciplinary approach, strict adherence to national guidelines, standardised trust protocols, patient information leaflets, standardised GP letters and a splenectomy register to monitor and manage these patients.

## Breast/Endocrine 0822

### Intra-Operative Imprint Cytology of the Sentinel Lymph Node in the Ultrasound-Negative Axilla: How many second operations are avoided?

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**Aims:** In patients with a positive sentinel lymph node (SLN), intra-operative testing of SLN allows an axillary clearance in the same sitting. However, a second operation may then become necessary for re-excision of margins of the primary

tumour. Axillary ultrasound (US) now identifies approximately 50% of positive axillae pre-operatively. Our aim is to study how many second operations are avoided by intra-operative imprint cytology (IOIC) in those with US-negative axillae.

**Methods:** We identified all patients who underwent IOIC over a 6-year period at our institution after a negative pre-operative axillary US from a prospectively entered database and reviewed their details.

**Results:** There were 423 patients with a median age 61 years (range 25–90). SLN biopsy was done using blue dye and isotope. IOIC was negative in 344 patients, indeterminate in 10 and positive in 69; all with a positive imprint had axillary clearance in the same sitting but 12 patients had to return for surgery for close margins. In total, 79 of 423 returned for a planned second operation; 18 for axillary clearance after a false negative or indeterminate imprint and others for further surgery for primary tumour +/- axillary surgery.

**Conclusions:** Intra-operative testing needed to be done on 423 patients to prevent 57 reoperations. Imprint cytology is neither costly nor time consuming and thus we feel that it is still a worthwhile addition to breast cancer surgery. However, this may not be true for more expensive tests that are more time consuming to perform, such as RNA-based tests. IOIC also has the advantages of avoiding the technical difficulty of delayed axillary surgery and patient distress resulting from recall.

## Breast/Endocrine 0835

### A 12 year experience of intraoperative parathyroid hormone (IOPTH) monitoring during parathyroidectomy

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**Aims:** Despite the relatively short half-life of PTH, spikes can occur during parathyroidectomy due to inadvertent manipulation of the parathyroid gland, masking the usefulness of IOPTH monitoring. The aim of this study was to ascertain the usefulness of IOPTH monitoring and the occurrence of IOPTH spikes.

**Methods:** A prospective database has been maintained since 2001. Data collected included demographics, date of surgery, preoperative calcium levels and preoperative and intraoperative parathyroid hormone levels, localisation studies and histopathology results. Statistical analysis was performed using SPSS (V20).

**Results:** 379 patients were included for analysis. In 34 patients (8.2%) there was an increase in PTH levels during surgery. (Table 1) 17 patients had radiological evidence of site concordance. 25 patients had a reduction in PTH on further testing, averaging 48.12% (SD21.3), while 4 patients had a further increase in PTH; of these 3 had a single adenoma and 1 had 4-gland hyperplasia.

**Conclusions:** IOPTH monitoring is useful in the majority of cases, however it is important to recognise PTH spikes during surgery; most of these patients had a decrease on further testing, and subsequent histology revealed an adenoma in the majority of cases. Overall, we had an excellent operative success rate with a low rate of operative failure (4%).

## Breast/Endocrine 0859

### Changes In The Management Of Hyperparathyroidism in the South-West Over 10 Years- A Review Of Referral Patterns and Pathways to Parathyroidectomy.

P. Leighton<sup>\*</sup>, A. Edwards, J. Morgan

North Bristol NHS Trust

**Aims:** The incidence of parathyroidectomy in England & Wales has almost doubled over the past decade. In the South-West of England the caseload has increased four-fold. There are several factors that could account for this large rise in operative numbers, not previously quantified. Understanding them will help streamline the service provided for this growing patient cohort.

The aim of this project was to quantify the changes in the group of patients undergoing parathyroidectomy.

**Methods:** We investigated by comparing two randomized groups of patients from two periods a decade apart (75 in 2003–2006 and 75 in 2013–2014). We analysed several factors in the patient path to operation, including demographics, the referral process, and management in outpatients.

**Results:** We found that referral patterns have changed- 74% of referrals are now from primary care, compared with 33% previously. In 45% the reason for referral is an abnormal blood test from a GP investigating symptoms; 19% are an incidental hypercalcaemia. This compares to 24% and 0% respectively a decade previously.

Inpatient referrals have dropped.

81% of patients are now seen by endocrinology before a referral to surgeons, compared to only 39% previously. Duration under endocrine investigation, before surgical referral, has significantly decreased (24 weeks compared to 57). Duration between surgical review and operation is significantly lower (16 weeks compared to 26). The proportion of renal patients is the same. Patient demographics were almost identical.

**Conclusions:** The results show that hyperparathyroidism management has moved to the outpatient department. Primary care is now the most important source of referral, and this avenue is being kept open with ongoing work on the primary-secondary care relationship.

The endocrinology and surgical services are working more closely together, with room for improvement. There was no evidence for an increase in referrals for renal patients and patient age remained the same between groups.

## Breast/Endocrine 0864

### Ultra-Violet Breast Tattoos (Non-Permanent Radiotherapy Marking)

T. Hampton\*, S. Rahman, S. Mackey

Queen Victoria Hospital

**Aims:** Our regional centre has performed >200 free flap autologous breast reconstructions in the last 2 years. During this time our team has been approached repeatedly with enquiries about alternatives to permanent blue dot radiotherapy marking tattoos. Conventionally our Oncology colleagues require a permanent solution when setting up breast cancer radiotherapy landmarks. This is preferred or justified due to the possibility of local recurrence and relapse. But other methods of marking do exist such as pen, temporary henna tattoo or ultraviolet visible techniques. Is now the time to think about a change in approach?

**Methods:** We conducted a literature review for all articles detailing use of non-permanent tattoos. We then issued questionnaires to consecutive patients in the Breast Reconstruction clinic to gauge their opinion.

**Results:** There were numerous studies which vouched for the safety and accuracy of henna tattoos or UV tattoos. There were numerous documentations of dissatisfaction with permanent tattoos. Our short patient survey of consecutive patients revealed that over 50% of patients were dissatisfied with the permanent ink tattoo.

**Conclusions:** Ease of clinic set-up and brevity of time were the greatest advocates of the permanent tattoo precedent but given the number of hours dedicated to Diep or Tram flaps in pursuit of a perfect reconstruction, surely we cannot encourage our colleagues in using permanent tattoos if equivalent, cost effective and temporary alternatives exist?

With changing paradigms in radiotherapy, The National Cancer Research Institute conference suggested interest and innovation amongst Oncologists and we hope our small contribution can add to the weight of evidence imploring invested parties from all specialties to consider the development and adoption of a new standard.

## Breast/Endocrine 0907

### Minimally Invasive Surgery with Intraoperative Gamma Probe Detection for Primary Hyperparathyroidism

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Complejo Hospitalario de Cádiz

**Aims:** Demonstrate the benefits of radioguide minimally invasive parathyroidectomy in primary hyperparathyroidism (PHTP) compared to minimally invasive surgery with intraoperative intact parathyroid hormone (io-PTH) assay.

**Methods:** 56 patients operated on PHTP. All of them had a cervical ultrasound and sestamibi scintigraphy to have a preoperative localization. Patients with secondary, tertiary or malignant hyperparathyroidism were excluded. All of them were operated using intraoperative gamma probe detection to focus the affected parathyroid gland with minimally invasive technique and io-PTH postexcision assay. A successful surgery was considered when io-PTH postexcision decreased at least 50%.

**Results:** 38 women/18 men. 15 patients have an uncertain preoperative scintigraphy result for parathyroid adenoma, 8 of them have a multinodular goitre. Io-PTH postexcision decreased more than 50% in 53 patients. The other three patients have more than one parathyroid gland affected, intraoperative gamma probe didn't detect another gland affected and unilateral or bilateral cervical exploration was performed; in these patients the io-PTH decreased after all the parathyroid glands affected excision. So false negative for intraoperative gamma probe detection compared with io-PTH were 5.3%. We compared the surgical time between minimally invasive surgery with gamma probe detection only or io-PTH only and the surgical time was shorter for surgery with gamma probe detection.

**Conclusions:** Minimally invasive surgery with intraoperative gamma probe detection for PHTP is useful and not inferior results to minimally invasive surgery with io-PTH, but the time is shorter for the first, that's the reason why we recommend this type of surgery in these patients.

## Cancer/Surgical Oncology (Other) 0976

### Patterns of Melanoma Recurrence Following a Negative Sentinel Lymph Node Biopsy

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**Aims:** Sentinel lymph node (SLN) status is recognised as a prognostic indicator in melanoma. However, in the setting of a negative SLN biopsy there remains a high risk of disease recurrence. Thus, we aimed to analyse the predictors and patterns of recurrence of melanoma in patients with a negative SLN biopsy.

**Methods:** We conducted a review of a prospectively maintained melanoma database. Melanoma patients who had a negative sentinel lymph node were identified and we performed statistical analysis on their respective demographics, tumour histology characteristics and follow-up data.

**Results:** Of 164 patients studied, 40 (23%) had a recurrence of melanoma at a median of 39.5 months following diagnosis (range 1–92 months). Recurrence was defined as any local recurrence, regional spread or distant metastases. Distant metastases were the most common form of disease recurrence (40% of all recurrences). 70% of all recurrences occurred in those with a primary tumour thickness >2.1 mm. Increasing tumour depth was an independent predictor of recurrence on multivariate analysis. Median survival of 6 months was seen following disease recurrence (range 1–126 months).

**Conclusions:** In the setting of a negative SLN biopsy there remains a risk of melanoma recurrence. Distant metastases were the most common form of recurrence. Disease recurrence occurred more frequently in those with thick primary tumours. Recurrences occurred at long intervals from diagnosis indicating the need to consider prolonged patient follow-up.

## Breast/Endocrine 0994

### Local Recurrence Following Breast Conserving Surgery for Ductal Carcinoma In-Situ: the Edinburgh Experience

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**Aims:** Ductal carcinoma in-situ (DCIS) represents 5% of symptomatic and 50% of screen-detected breast malignancies. Historically managed with mastectomy, providing excellent long-term outcomes, Breast Conserving Surgery (BCS) +/- adjuvant radiotherapy now represents the mainstay

management option for DCIS providing better cosmetic outcomes with no adverse impact on overall survival. The main drawback of BCS remains local recurrence - DCIS or invasive breast cancer, which are associated with significant morbidity and mortality. Given advances in DCIS management, the study aims to compare local recurrence rates as well as 'time to recurrence' over the last 10 years to previously published data from the Edinburgh breast unit.

**Methods:** A retrospective single-centre study of patients with histologically confirmed primary DCIS who underwent BCS between January 2000 and January 2010. Data on demographics, tumour and patient characteristics, treatments administered, and follow-up were collated.

**Results:** Of the 477 eligible patients, 7.8% (n = 37) developed local recurrence following BCS (median follow-up = 63 months), a significant decrease from 15% previously reported within the same unit. The median time-to-recurrence was 27 months. There is also trend towards decreasing local recurrence rates with increasing use of adjuvant radiotherapy.

**Conclusions:** Advances in DCIS management and widespread use of adjuvant radiotherapy have contributed to a significant reduction in local recurrence rates following BCS for DCIS.

## Breast/Endocrine 1020

### The Value of Ultrasound in The Detection of Metastatic Lateral Neck Lymphadenopathy in Papillary Thyroid Cancer

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*James Cook University Hospital*

**Aims:** Neck ultrasound (US) is the principle radiological modality for investigating thyroid cancer. There is a paucity of literature on the reliability of ultrasound in the detection of malignant lateral lymph nodes in thyroid cancer. We evaluate the reliability of US in this setting.

**Methods:** Retrospective review of 14 patients with a histological diagnosis of papillary thyroid cancer who underwent total thyroidectomy plus lateral dissection as a combined primary procedure for suspected thyroid cancer over a thirty month period (2011–2013) by a single surgeon at a single centre. Patient demographics, pre-operative US and post-operative histology results were compared. Mean follow-up period was 29 months (12–44).

**Results:** 14 lateral dissections were performed, (mean 44 years/12:2 M:F) of which 12 (86%) were proven to have metastasis. In 11 (79%), US findings were suggestive of metastatic lymphadenopathy. 3 (21%) cases had negative US results with positive histology. Of these 3 patients, 2 (14%) underwent surgery based upon clinical findings. The remaining patient had a CT scan prior to surgery. 13 (93%) patients underwent fine needle aspiration cytology (FNAC). 2 (14%) with suspicious findings on US had lateral neck dissections where no metastatic nodes were identified on histology. Both underwent FNAC. US sensitivity 79% (CI 49–95%), PPV 84% (55–98%). Mean survival 29 months (12–44). There was 1 mortality 24 months following surgery.

**Conclusions:** US is a useful tool in identifying patients who have lateral lymphatic changes secondary to metastatic papillary thyroid cancer. However in our small study 2 patients had unnecessary neck dissection based upon radiological findings. In patients where US and FNAC are inconclusive further imaging modality and discussion should be considered to reduce the risk of unnecessary surgery.

## Lower GI 2

### Hernia/Soft Tissues 0063

#### Prophylactic mesh repair for the prevention of parastomal herniation: A case controlled comparative study between the prophylactic mesh and non-mesh group

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**Aims:** To ascertain whether prophylactic mesh reinforcement at stoma formation with a composite synthetic mesh reduces the incidence of parastomal herniation.

**Methods:** Prospectively collected data from 1st January 2009 to 31st December 2013 for patients undergoing prophylactic parastomal reinforcement with a Dynamesh-IPOM mesh in a keyhole configuration, using a laparoscopic intra-peritoneal onlay technique was compared to a cohort of matched patients undergoing stoma-forming procedures without prophylactic mesh using a single-centre, single-surgeon case-control study design.

The primary outcome was development of a parastomal hernia on clinical or radiological examination. Age, gender, BMI, ASA, operative time, inpatient stay, length of follow-up and incidence of hernias was compared between groups.

**Results:** There were 11 patients in the prophylactic group (8 APER, 3 Hartmann's procedures) (mean age 67 years  $\pm$  11.9, M:F 8:3, median BMI 29 [95% CI 23–34]). Median operative time was 300 mins [95% CI 205–337]. One was converted to an open procedure. After a median follow-up of 20 months [95% CI 6–27] none developed a parastomal hernia.

Of 19 patients in the control group (13 APER, 5 Hartmann's, one left hemicolectomy) (Mean age 72.4 years  $\pm$  14.0, M:F 12:7, median BMI 27.1 [95% CI 21.8–37.3]), median operative time was 300 mins [95% CI 230–435] and one was converted to open. After a median follow-up of 15 months [95% CI 6–29] six patients (31.6%) developed a parastomal hernia. Two had subsequent hernia repair (one elective, one emergency).

There were no differences between groups for age, gender, ASA, BMI, operative time, inpatient stay, conversion or length of follow-up and no infective complications of the parastomal wound. There was a significant association of herniation without mesh reinforcement;  $\chi^2$  (1) = 4.34,  $p < 0.05$ .

**Conclusions:** Prophylactic stomal mesh reinforcement with a composite synthetic mesh using an intraperitoneal onlay technique reduces the incidence of parastomal hernias in patients undergoing stoma formation without additional infective complications.

### Audit and Outcomes Research 0170

#### Anterior Resection Syndrome- A Review of Patient Experience

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<sup>1</sup>Doncaster & Bassetlaw NHS Foundation Trust, United Kingdom

**Aims:** Most patients with mid to low rectal cancers can be treated with low anterior resection (LAR).

However, after LAR upto 60% of patients suffer functional deficit in the form of faecal urgency/leakage and disturbance of sexual function, labelled as Anterior Resection Syndrome (ARS); this can last for upto 2 years and can have a major impact on the quality of life. The aim of this study was to scrutinize the peri-operative information provided to such patients and make appropriate recommendations.

**Methods:** Single-centre retrospective-audit of patients who underwent LAR in 2010.

**Results:** 40 patients (26 males) underwent LAR. In 9 patients continence history was taken (seen by Nurse Practitioner). 8 patients had anal sphincter assessment recorded. 18 patients were consented by a consultant; in 11 cases ARS not mentioned; in 7 cases 'urinary and sexual dysfunction' was mentioned. Rest were consented by Spr/SAS with no mention of ARS. None of the 17 patients

with defunctioning ileostomy were informed of ARS prior to the reversal. 7 patients described increased frequency of bowel action. 4 male patients had erectile or ejaculatory dysfunction documented. In regular follow-up visits, the assessment of symptoms was not uniform or objective and relied on terms such as miserable function, erratic bowels etc Recommendation Consent: Standardised information regarding LAR (and other colorectal resections) complications printed on sticky labels for consent forms is now available and used. Information Booklet: a detailed account of ARS is now included in patient's preoperative package. Nurse Led Follow-up: Standardized questionnaire for bowel, urinary and sexual symptoms. (HERE A FLOW CHART/PATHWAY WILL BE ADDED TO THE POSTER)

**Conclusions:** As a result of this audit we now provide comprehensive information to our patients undergoing LAR or defunctioning ileostomy reversal following LAR. (This study was selected for presentation at the Annual Trust's Audit Day, 2013)

### Audit and Outcomes Research 0373

#### Colonoscopy: To scope or not to scope?

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**Aims:** Same-day colonoscopy cancellations have a large financial impact on the NHS and a clinical impact on the patient and those waiting.

We set out to evaluate same-day colonoscopy cancellations and determine reasons for cancellations with the aim of identifying shortfalls and improving services.

**Methods:** A retrospective review identified 52 patients with same-day colonoscopy cancellations from February 2012 to July 2014 from a single endoscopist's list. Colonoscopy reports from Unisoft were obtained and analysed for indications and reasons for cancellation. Hospital databases were used to access previous colonoscopy and histology reports.

**Results:** 8.9% of all requested colonoscopies were cancelled on the day of the procedure over a 2.5 year period. 34.6% of patients were cancelled as a result of the procedure not being indicated, with 77.7% due to inappropriate follow-up for polyp surveillance, against BSG guidelines. 26.9% of patients were cancelled due to inadequate bowel preparation.

**Conclusions:** Colonoscopy remains the gold-standard investigation of choice for a number of colorectal symptoms. It is however resource intensive and expensive, with demand for services currently outweighing supply.

We highlight poor adherence to BSG guidelines with regard to polyp surveillance in this study with potential for improvement.

### Emergency Surgery including Trauma (ASGBI) 0378

#### A prospective audit of emergency major laparoscopic colorectal surgery

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**Aims:** Laparoscopic surgery in the emergency setting for acute colorectal disease is not yet unanimously approved. We aim to assess the feasibility of laparoscopic colorectal surgery in the emergency setting.

**Methods:** Retrospective analysis of a prospectively collected database of all major laparoscopic colorectal resections performed by a single surgeon in a DGH over 12 years was performed. Laparoscopic stoma and appendectomy were excluded. Patients admitted as an emergency were identified and demographics, operation type, conversion rate, histology, length of stay, morbidity and mortality were recorded. Where appropriate data was compared with that of patients in the elective setting.

**Results:** A total of 330 laparoscopic major colorectal resections were performed over 12 years. 25 emergency procedures were undertaken over 8 years on 14 F:11 M with median age 39 (18–77) years, BMI 26 (18–30), 12% ASA  $\geq$  3. Operations included 8 right hemicolectomies, 3 Hartmann's procedures, 11 subtotal colectomies, 2 laparoscopically managed anastomotic leaks and 1 resection for small bowel Crohn's. Histology revealed 15 complicated IBD, 3 adenocarcinomas, 2 diverticulitis, 2 volvulus and 1 idiopathic gangrenous caecum. No re-operations were necessary and there was no mortality. 2 major morbidities occurred in the form of intra-abdominal collections. There were 2 readmissions for an intra-abdominal collection and pneumonia respectively. Comparable demographics in the elective group were 148 F:157 M, median age 70 (17–95) years, BMI 26 (15–40) and 33% ASA  $\geq$  3. There were no significant differences between emergency and elective patients in terms of ASA  $\geq$  3 ( $p=0.066$ ), ITU admission ( $p=1.0$ ), conversion rate ( $p=1.0$ ), length of stay ( $p=0.085$ ), major morbidity ( $p=0.66$ ) or mortality ( $p=0.085$ ).

**Conclusions:** Laparoscopic surgery for colorectal disease is a feasible and safe option in the emergency setting however careful patient selection and the availability of appropriately training staff out of hours are of paramount importance for successful outcomes.

## Audit and Outcomes Research 0485

### Outcome of recurrent acute diverticulitis - A district general hospital experience

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<sup>1</sup>Walsall Manor Hospital, United Kingdom

**Aims:** There is no agreed consensus on the management of recurrent (two or more) episodes of acute diverticulitis (RCS Commissioning Guide 2013). Our aim was to look at the outcome of recurrent episodes in our hospital.

**Methods:** A retrospective analysis from 2009 to 2014. Patients had a prior diagnosis of diverticulitis confirmed by CT followed by either colonoscopy or barium enema. Data was collected from patient records, electronic discharge summaries, radiology and endoscopy reports. We included only patients readmitted with diverticulitis confirmed by CT or colonoscopy.

**Results:** 21% (51/243) of patients were readmitted with acute diverticulitis (18 males, 33 females). Forty patients were between the age of 50 to 89. The diagnostic modality was colonoscopy and CT in 30 and 21 patients respectively. 45 patients were readmitted once (mean length of stay was 7 days), and 6 had multiple readmissions (mean length of stay was 11 days).

33% (17/51) patients underwent surgery (elective 13, emergency 4). In the elective surgery group 12 patients waited less than 12 months before undergoing surgery.

The different types of procedures performed are listed in table 1 and 2 respectively.

The post operative complications are listed in table 3.

There was no operative mortality but two non-operative mortalities (deemed too high risk for surgery).

**Conclusions:** 33% of recurrent admissions required operative intervention. In a financially challenged climate, readmissions with length of stay have cost implications. We suggest early surgical intervention in this subgroup.

## Audit and Outcomes Research 0489

### Quality Control and Credentialing guidelines in Colonoscopy

M. N. Maung<sup>1</sup>\*, H. Abudeeb<sup>1</sup>, P. Alexander<sup>1</sup>, E. McNaughton<sup>1</sup>, A. Mukherjee<sup>1</sup>

<sup>1</sup>Hairmyres Hospital, United Kingdom

**Aims:** Colonoscopy remains the gold standard investigation for most colorectal diseases and the key measurable quality indicator is the caecal intubation rate. Minimum caecal intubation rates greater than 90% have been endorsed by the American Society for Gastrointestinal Endoscopy (ASGE) and the Joint Advisory Group (JAG) UK.

Quality assurance of colonoscopy could be expected to contribute significantly to improved patient care. Unfortunately, disparity in quality prevails even

amongst accredited dedicated colonoscopists. The aim of this study is to assess the impact of confounding factors on the performance of accredited endoscopist.

**Methods:** A retrospective analysis of prospective annual colonoscopy data of a designated accredited colonoscopist from April 2013 to March 2014 was undertaken.

**Results:** Total number of colonoscopies performed over a period of 12 months were 740. Caecal intubation rate (corrected for pathology) was 87.16% (645). 20 were incomplete due to poor bowel preparation and 74 due to looping, discomfort, pain, sigmoid angulation and withdrawal of consent.

**Conclusions:** Amongst the different confounding factors, poor bowel preparation, in this study, contributed significantly towards incomplete caecal intubation. Quality improvement in colonoscopy should focus not only on improving technical skills but equally on methods to optimize bowel preparation and emphasize on stringent patient selection to minimise repeat procedures. Detailed breakdown and appropriate adjustment for confounding factors would probably favour a better quality comparison than an universally defined completion rate.

## Audit and Outcomes Research 489

### Quality Control and Credentialing guidelines in Colonoscopy

MN Maung<sup>1</sup>\*, H Abudeeb<sup>1</sup>, P Alexander<sup>1</sup>, E McNaughton<sup>1</sup>, A Mukherjee<sup>1</sup>

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## Audit and Outcomes Research 0515

### Straight to Test: Speeding up Colorectal Cancer Management. A Complete Audit Cycle

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**Aims:** To assess the impact of 'Straight to Test' on the 62-day cancer pathway, where a diagnostic procedure is arranged as the first episode of care following telephone consultation as opposed to an outpatient appointment.

**Methods:** Data was collected prospectively for 62-day cancer pathway breaches occurring within the colorectal department of St Mary's Hospital London; 12 months before and 3 months following the introduction of Straight to Test. This data was further broken down, Mar-May 2013 and Mar-May 2014 for a direct comparison of outcomes. The gold standard being no breaches against the National Cancer Standard of the 62 day cancer pathway.

**Results:** The majority of breaches (64%) occurred due to delay before diagnostics. Root cause analysis showed 16% breaches were a result of CT pneumocolon delays, however most delays (44%) were due to patient factors or patient choice. Following the introduction of the 'Straight to Test' pathway, the number of breaches reduced to 5 compared to 12 for the same time period a year before.

**Conclusions:** Breaches of the 62-day cancer treatment pathway more than halved following the introduction of Straight to Test, which essentially cuts out the initial 2-week wait for an outpatient appointment with the surgeon. This is a viable, effective way of reducing treatment delays thus improving patient care. Further analysis is required to determine whether appropriate investigations are occurring when patients are not initially evaluated in clinic.

## Emergency Surgery including Trauma (ASGBI) 0520

### Identifying patients at risk of requiring emergency colorectal cancer surgery in England

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**Aims:** Patients undergoing emergency colorectal surgery are at risk of poor outcome. The aim of this national study is to identify groups at high risk of undergoing surgery, their subsequent mortality and overall survival.

**Methods:** The Hospital Episode Statistics (HES) database between the years of 1997–2012 was used to identify all patients that underwent surgery for colorectal cancer. Multiple logistic regression analysis was undertaken to identify patient factors predictive of undergoing emergency (rather than elective) surgery. Cox Regression analysis was used to examine differences in overall survival.

**Results:** A total of 286,591 patients underwent resection for CRC. Of these, 69,718 (24.3%) patients underwent emergency surgery. Independent predictors of undergoing emergency surgery were female gender (OR 1.23, CI: 1.21–1.25, <0.001), older age (>79 years old OR 1.55, CI: 1.50–1.60, <0.001), social deprivation (most deprived quintile, OR 1.64, CI: 1.50–1.80, <0.001), Black African/Caribbean ethnicity (OR 1.36, CI: 1.21–1.66, <0.001) and Chinese ethnicity (OR 1.50, CI: 1.05–2.13, *p* = 0.026). All cause 30-day and 90-day mortality within the emergency group was significantly higher than the elective group (30-day; 13.3% compared with 3.4%, 90-day; 20.0% compared with 5.8%). There was a significant drop in the rate of emergency presentation from 23.4% to 14.9% (<0.001) between those patients diagnosed before 2006 and those diagnosed after. However, of those attending as an emergency, there was no difference in 30-day mortality between the pre and post screening groups within this cohort (before screening 8.4%, after screening 7.6%, *p* = 0.125).

**Conclusions:** Emergency presentation occurs commonly in patients with colorectal cancer. Older, socially deprived and ethnic minority patients are more likely to present as emergencies requiring surgery. Emergency presentation has reduced following introduction of bowel cancer screening. Public health initiatives aimed at identifying patients at specific risk of, and preventing, emergency presentation could significantly improve survival outcome for colorectal cancer.

## Surgical Complications 0542

### Statins do not reduce the risk of colorectal anastomotic leak

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**Aims:** A small number of studies investigating the effect of statins upon anastomotic leak have yielded conflicting results, with some literature suggesting that statins reduce the risk of anastomotic leak. We aimed to explore the link between statins and anastomotic leaks in our practice. Statins are amongst the most commonly prescribed drugs in the developed world. Statins are known to affect the inflammatory response, white cell function, endothelial function

and angiogenesis, all of which are fundamental to tissue healing, therefore it is plausible that statins may influence anastomotic healing.

**Methods:** A prospectively maintained database of patients undergoing surgery requiring primary anastomosis, for both benign and malignant disease, in a single-centre teaching hospital was created. Information was collected on patient demographics, medications, pre-operative blood results and post-operative course. Group comparisons were performed using Mann-Whitney U test and Fisher's Exact test.

**Results:** 120 patients (66 male). Median age 66 years (Interquartile range 56–74 years). 6 (5%) patients had radiologically confirmed anastomotic leak (Table 1). 46 (38.3%) patients were taking statins pre-operatively. Statins were not associated with reduced risk of anastomotic leak. Pre-operative eGFR (*p* = 0.018) and maximum 7-day CRP (*p* = 0.003) were significant predictors of anastomotic leak.

**Conclusions:** Evidence from this study, in a population with a much higher statin usage than the UK general population, does not suggest that statins alter the risk of anastomotic leak in, although it remains possible that statins normalise the leak risk in a patients believed to be at high risk of leak. Impaired pre-operative renal function, and CRP over 217 within 7 days of operation were significantly associated with leak. We conclude that it is safe for patients undergoing colorectal anastomosis to continue lipid-lowering therapy in the perioperative period.

## Surgical Complications 0586

### Systematic review and meta-analysis of published randomized controlled trials comparing purse string versus conventional linear closure of the wound following ileostomy (stoma) closure

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**Aims:** The objective of this article is to systematically analyse the randomized, controlled trials comparing the effectiveness of purse string closure (PSC) versus conventional linear closure (CLC) of ileostomy wound.

**Methods:** Randomized, controlled trials comparing the effectiveness of purse string closure (PSC) versus conventional linear closure (CLC) of ileostomy wound in patients undergoing ileostomy closure were analysed using RevMan<sup>®</sup>, and combined outcomes were expressed as risk ratio (RR) and standardized mean difference (SMD).

**Results:** Three randomized, controlled trials recruiting 206 patients were retrieved from medical electronic databases. There were 105 patients in the PSC group and 101 patients in the CLC group. There was no heterogeneity among included trials. Duration of operation (SMD, 0.18; 95% CI, 0.45, 0.09; *z* = 1.28; *p* < 0.20) and length of hospital stay (SMD, 0.01; 95% CI, 0.26, 0.28; *z* = 0.07; *p* < 0.95) was statistically similar following both approaches of ileostomy wound closure. The risk of surgical site infection (OR, 0.10; 95% CI, 0.03, 0.33; *z* = 3.78; *p* < 0.0001) was significantly reduced when ileostomy wound was closed using PSC technique.

**Conclusions:** PSC technique for ileostomy wound is associated with a reduced risk of surgical site infection apparently without influencing the duration of operation and length of hospital stay.

## Audit and Outcomes Research 0793

### An audit into the management of chronic anal fissure

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**Aims:** Anal fissure is one of the commonest proctologic diseases with considerable national variation in sequential treatment. Management strategies are all based on reducing anal tone, with national guidance provided by the Association of Coloproctology of Great Britain and Ireland (ACPGBI) (see Figure 1). We

aimed to audit our compliance of anal fissure management with the ACPGBI guidelines.

**Methods:** We retrospectively audited patients presenting to colorectal, general surgical and gastroenterology clinics with acute or chronic anal fissure over a 6-month period. Using electronic patient records, notes and clinic letters, we compared their management with that of the ACPGBI algorithm.

**Results:** 41 patients were included for analysis (17 females, 24 males). 68.3% (n = 28) of patients were appropriately started on conservative dietary therapy, of whom only 7.1% (n = 2 of 28) were successfully treated. 89.3% (n = 25 of 28) were then appropriately treated with either topical diltiazem 2% or GTN. Of these, 32% (n = 8 of 25) were treated successfully, with another 32% (n = 8 of 25) appropriately treated with botulinum toxin (Botox). Of these 8 Botox patients, 50% (n = 4) required further surgical management (n = 3, lateral sphincterotomy or fissurectomy; n = 1, anal dilatation). Overall, 41.5% (n = 17 of 41) of all patients' entire management strategy adhered to the ACPGBI guidelines. In total, 22 patients had surgical treatment (excluding Botox), of which only 13.6% (n = 3) had undergone ACPGBI-compliant management.

**Conclusions:** Topical diltiazem/GTN was the most successful treatment in ACPGBI-compliant strategies, leading to success in 52.9% (n = 9 of 17). Importantly, our data suggests that compliance with the ACPGBI management algorithm leads to treatment success without surgery in 82.4% (n = 14 of 17) of patients, compared to 20.8% (n = 5 of 24) in noncompliant patients (Fisher's exact test  $p = 0.027$ ). This highlights the benefit of early conservative and medical management of chronic anal fissure before attempting surgery associated with significant risks such as incontinence.

## Audit and Outcomes Research 0811

**The National Complicated Acute Diverticulitis (CADS) Audit: time to look closely.**

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**Aims:** Acute complicated diverticulitis (ACD) is a common surgical emergency with significant implications for patients like major surgical intervention, intensive care support and life-long stoma. However, there is currently no standardization of care or unified national guidelines. This audit aims to generate baseline data to inform future randomised controlled trials.

**Methods:** A protocol was developed and nationally peer-reviewed for a national audit with a pre-audit questionnaire exploring existing management policy for ACD, followed by 3 months of data collection on patient demographics, admission details, surgical intervention, mortality and morbidity. Finally, a one-off follow-up was at 3 months from the date of admission to assess short-term outcome.

**Results:** The national CADS audit has successfully launched with 107 centres participating nationally. The data-collection phase is ongoing with nearly all participants having submitted the unit policy questionnaire and more than 1800 patient records in the database so far. More results will be available at the conclusion of phase 2 on 31st January 2015 which will be presented. Please refer to our website [www.cadsaudit.org.uk](http://www.cadsaudit.org.uk) for updates.

**Conclusions:** The audit has generated data on an unprecedented number of patients with diverticulitis. It is anticipated that these data may refine several pressing questions relating to the management of ACD, like role of or need for radiological and drainage of sepsis, major surgical resection with or without primary anastomosis and stoma formation. This may enable development of robust randomised controlled trials with potential to generate level 1 evidence.

## Cancer/Surgical Oncology (GI) 0918

**Vertical rectus abdominis myocutaneous flap versus alternative reconstructive options for perineal repair following abdominoperineal excision of the rectum in the era of laparoscopic surgery.**

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**Aims:** Plastic surgical reconstruction of the perineum is often required following abdominoperineal excision of the rectum (APER). Options for this reconstruction include a vertical rectus abdominis myocutaneous (VRAM) flap, gluteal fasciocutaneous flap and a gracilis myocutaneous flap. While the VRAM flap is well established at most centres and is discussed extensively in the literature, less experience exists with the gluteal and gracilis flaps. In the era of laparoscopic colorectal resection plastic surgeons are being forced to use gluteal and gracilis flaps, because the VRAM flap must be tunnelled intra-abdominally requiring laparotomy. We therefore aimed to systematically review the evidence comparing gluteal, gracilis and VRAM flaps.

**Methods:** A comprehensive, structured literature search was conducted using Medline, Google Scholar, Science Direct and the Cochrane library, for studies investigating reconstruction of the perineum following abdomino-perineal excision of the rectum. Studies included were randomised control trials and observational studies documenting complication rates associated with the VRAM, gluteal or gracilis flap.

**Results:** 11 studies meeting all inclusion and exclusion criteria were identified. When meta-analysed the overall rate of any perineal wound or flap complication amongst VRAM patients (35.8%) was significantly lower than gluteal flap patients (43.7%) and gracilis flap patients (52.9%) ( $p = 0.041$ ). The evidence also highlighted that the VRAM flap provides ample tissue for dead space obliteration, provides tissue that is not exposed to radiation if neo-adjuvant radiotherapy is required and can readily be used for concurrent vaginal reconstruction.

**Conclusions:** The VRAM flap is well established for perineal reconstruction and this study suggests it may be superior to the gluteal and gracilis flaps in terms of perineal wound and flap complications rates. This should be taken into account when weighing up the risks and benefits of a laparoscopic approach to APER. Large studies making direct comparisons between the flap options should be conducted.

## Audit and Outcomes Research 0946

**Bowel Cancer Screening: detecting colorectal cancers at an earlier stage than non-screening detected colorectal cancers**

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**Aims:** To establish if, within the North of Scotland, screening-detected colorectal cancers were at an earlier stage than non-screen detected cancers for the period of 2010–12.

**Methods:** Prospective data identification by inclusion of all patients discussed at a regional multi-disciplinary colorectal cancer meeting with retrospective data analysis. Three years of colorectal cancer patients were identified and their records checked for: method of diagnosis (Bowel Screening versus Non-Bowel Screening programme) and stage of disease at diagnosis. Analysis (one-way ANOVA) was performed using SPSS 22.0.

**Results:** A total of 517 colorectal cancer patients were identified. 59 patients were excluded from analysis as either: patients were not deemed fit enough to be investigated further; underwent EMR; had died during staging or their malignancy was not colorectal in origin. Of the 517 total cancers 122 (23.6%) were detected by screening. Of the staged screening-detected cancers: 45 (39.1%) were Dukes' A; 31 (18.3%) were Dukes' B; 32 (27.8%) were Dukes' C and 7 (6.1%) were Dukes' D. 7 patients were not staged. Considering the non-screening-detected cancers: 59 (17.2%) were Dukes' A; 103 (30.0%) were Dukes' B; 113 (32.9%) were Dukes C and 68 (19.8%) were Dukes' D; 52 were not staged ( $< 0.001$ ).

The average patient age at diagnosis when detected by screening was 60.9; in the non-screen detected the average age at diagnosis was 69.4 ( $p = 0.35$ ).

**Conclusions:** Our data supports the position that the National Bowel Screening Programme detects colorectal cancers at an earlier stage than those presenting with de novo disease. As the screening programme had been started within the year previous to the study, it is likely that the higher number of screening-detected later stage cancers in this study represent the 'prevalent round' associated with screen-detected cancers and this will drop with each subsequent round of screening.

## Surgical Complications 0990

**CRP as an early predictor of anastomotic leak in open and laparoscopic colorectal surgery**A. Peleki<sup>1\*</sup>, J. Ng<sup>2</sup>, A. Jones<sup>2</sup>, P. Waterland<sup>2</sup>, S. Pandey<sup>2</sup><sup>1</sup>Queen Elizabeth Hospital, Birmingham, <sup>2</sup>Worcester Royal Hospital, United Kingdom**Aims:** Early diagnosis of anastomotic leak (AL) reduces mortality following colorectal resection. Laparoscopic surgery may provoke less of an inflammatory response than the equivalent operation performed open.

This observational study assesses CRP as an early predictor of AL and compares laparoscopic and open colorectal surgery.

**Methods:** All patients undergoing colorectal surgery with anastomosis were enrolled into a prospective database. Basic demographic data, results, milestones and complications were recorded.

AL was defined with strict operative and radiological criteria.

Outcomes were assessed statistically and Receiver Operating Characteristic (ROC) curve analysis performed.

**Results:** A total of 759 patients (median age 69 years [range 14–94], M449:F310) underwent colorectal surgery with anastomosis (499 laparoscopic, 260 open) between 10/2011 and 10/2014.

There were 62 (8.1%) anastomotic leaks of which 30 (6.0%) were laparoscopic and 31 (11.9%) open, with a strong statistical difference demonstrated between AL and no leak from day 1 to 7 for both groups (Mann-Whitney &lt;0.0001).

ROC curve analysis revealed a CRP of 140 on day 2 to be 76% sensitive and 70% specific for AL in the laparoscopic group. Area under the graph fell gradually until day 7. CRP was significantly higher in patients undergoing open surgery regardless of outcome (fig 1).

ROC curve analysis in the open group revealed a day 3 CRP of 200 to be 76% sensitive and 80% specific for AL. On each curve a rising CRP reduced sensitivity but increased specificity of the test in successfully detecting AL.

**Conclusions:** CRP is an excellent early predictor of anastomotic leak in colorectal surgery and is a cost-effective means of risk stratification. CRP is higher after open surgery regardless of outcome. After laparoscopic resection a CRP of 140 or greater on day 2, or a CRP of 200 or greater on day 3 in open surgery should raise the possibility of anastomotic leak.

## Audit and Outcomes Research 1048

**Predicting blood transfusion requirements in colorectal cancer surgery**G. R. Nana<sup>1\*</sup>, A. Noorani<sup>2</sup>, K. Navaneetham<sup>3</sup>, A. S. Navi<sup>3</sup>, F. D'Souza<sup>2</sup><sup>1</sup>Buckinghamshire Healthcare NHS Trust, <sup>2</sup>Frimley Health NHS Foundation Trust, <sup>3</sup>Oxford University Hospitals NHS Trust, United Kingdom**Aims:** Colorectal cancer patients are often anaemic preoperatively. However blood products are commonly cross-matched and not transfused, leading to wastage of a valuable resource. We evaluated transfusion practice at our hospital, aiming to develop a protocol for pre-operative correction of anaemia, blood cross-match and transfusion requirements in patients undergoing major colorectal cancer surgery.**Methods:** All patients undergoing colorectal cancer surgery over a period of 8 months were retrospectively identified from our electronic database. Outcomes

included tumour size, operation type, pre-operative Haemoglobin (Hb) and iron levels. Cross-match to transfusion (C/T) ratio &lt;2 and pre-operative iron levels were our standards as per best available evidence. Logistic regression modelling identified predictors for transfusion requirements.

**Results:** Ninety four patients (M:F = 58:36) were identified over 8 consecutive months. All patients had pre-operative group and save with antibody screening. Mean pre-op Hb was 120 g/dL. Only 20% (n = 19) of patients had Iron levels checked pre-operatively. A total of 78 units were cross-matched with 54% transfused (C/T ratio: 1.77). Thirty six units (46%) were returned to the lab, unused. Logistic regression modelling identified that pre-operative Hb <8.5 and tumour size > T3 are reliable predictive factors for blood transfusion (<0.05), while age, type of operation and serum iron levels showed no significant association.**Conclusions:** The financial and resource burden on transfusion services remains a critical area for quality improvement. We introduced a new cross-matching protocol in anaemic colorectal cancer patients prior to surgery. Regular re-audit is required to ensure compliance and patient safety remain paramount.

## General 1059

**Short-term outcome of halo procedure +/- mucosal plication: Our hospital experience**C. Weerasinghe<sup>1\*</sup>, T. Suriyakumaran<sup>1</sup>, T. Linn<sup>1</sup><sup>1</sup>Blackpool Victoria Hospital, United Kingdom**Aims:** Haemorrhoidal artery ligation (HALO) represents a minimally invasive, relatively painless method to surgically treat haemorrhoids with reported low morbidity and satisfactory short-term outcomes. This is used as an alternative to conventional haemorrhoidectomy or stapled haemorrhoidopexy in short or medium term. This study looked at the success of this technique in our colorectal department to ascertain its' success rates in the treatment of haemorrhoids.**Methods:** 61 patients (33 male and 28 female) who underwent a HALO procedure between 2012 to 2014 were reviewed. Data was collected from pre-operative and post-operative clinic letters. Patients were seen in clinic post-procedure, where the average follow-up appointment was at 8 weeks.**Results:** 61 subjects who had HALO +/- mucosal plication between 2012-2014 were reviewed. Most patients who underwent HALO had 3rd degree haemorrhoids. 12 of 61 patients (20%) did not attend first clinic follow-up. Therefore our subject number was n = 49 (80%). There was a positive experience overall with all subjects; (42/49): 86% satisfied. Further procedure required in 7 out of 49 patients (14%). This included HALO, HALO + mucosal plication, limited haemorrhoidectomy, banding of haemorrhoid, laying open of fistula.**Conclusions:** 86% were satisfied with the procedure. 10% of those with minor complications complained of mainly pain, ongoing intermittent PR bleeding, prolapsed haemorrhoids. Those with prolapsed haemorrhoids were offered more standard techniques of ligation or haemorrhoidectomy, however declined. Correlating with patient satisfaction from our local study, the results suggest that the HALO procedure can be widely used for treatment of haemorrhoids.

## Oesophagogastric Cancer Upper GI

### Cancer/Surgical Oncology (GI) 0042

#### Outcomes Following Anaemia in Oesophagogastric Cancer: Survival Relates to Anaemia at Diagnosis

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**Aims:** To identify incidence of anaemia, change in haemoglobin, rates of blood transfusion and mortality associated with the diagnosis and treatment of oesophagogastric cancer.

**Methods:** We conducted a retrospective analysis of all patients diagnosed with oesophagogastric cancer in 2012 at a single high-volume referral centre. Data was collected on site, histology, staging, haemoglobin, blood transfusions, survival and treatment. WHO definitions were used to define anaemia.

**Results:** 250 patients were included in the study. Mean haemoglobin at diagnosis was 127 g/L (S.D. 22.7 g/L). 99 patients (40%) were anaemic at diagnosis with higher rates of anaemia in gastric cancer compared to oesophageal cancer (<0.001). In 61 patients, anaemia was normocytic (62%) and 38 patients microcytic (38%).

In the 95 patients treated with surgery, 36 (38%) were anaemic at diagnosis. However, this increased to 66 patients (69%) prior to surgery and 88 (92%) post-operatively. Neo-adjuvant chemotherapy increased the number of patients who were anaemic prior to surgery by 15% and the average drop in haemoglobin from 7.4 g/L to 15 g/L compared to those who went straight to surgery.

Those anaemic at diagnosis had a significantly poorer survival compared to those without anaemia ( $p=0.035$ ). Further, moderate and severe anaemia had poorer survival when compared with mild anaemia ( $p=0.048$ ).

If anaemic at diagnosis or prior to surgery, patients were 69% and 59% more likely to receive a blood transfusion respectively.

**Conclusions:** Anaemia was present in 40% of patients at diagnosis and increased further over the treatment course to over 90% after surgery. It was associated with increased mortality and more blood transfusions. Anaemia was more common and severe with neoadjuvant chemotherapy. A more proactive strategy to the management of anaemia is required if we are to attempt to avoid the excess mortality and blood transfusions seen here in oesophagogastric cancer.

### Perioperative Care/Nutrition 0059

#### The Effects of Immunonutrition in Upper Gastrointestinal Surgery: A Systematic Review and Meta-analysis

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**Aims:** The beneficial of immunonutrition on overall morbidity and mortality remains uncertain. We undertook a systematic review to evaluate the effects of immune-enhancing enteral nutrition (IEN) in upper gastrointestinal (GI) surgery.

**Methods:** Main electronic databases [MEDLINE via Pubmed, EMBASE, Scopus, Web of Knowledge, Cochrane Central Register of Controlled Trials (CENTRAL) and the Cochrane Library, and clinical trial registry (ClinicalTrials.gov)] were searched for studies reported clinical outcomes comparing standard enteral nutrition (SEN) and immunonutrition (IEN). The systematic review was conducted in accordance with the PRISMA guidelines and meta-analysis was analysed using fixed and random-effects models.

**Results:** Nineteen RCTs with a total of 2016 patients (1017 IEN and 999 SEN) were included in the final pooled analysis. IEN significantly reduced post-operative wound infection (risk ratio (RR) 0.69, 95% confidence interval (CI) 0.50 to 0.94). Although, the combined results showed that IEN had a shorter hospital stay (RR -2.51 days, 95% CI -3.47 to -1.55), there was significant heterogeneity observed across these studies. There was no statistically

significant benefit on other post-operative morbidities of interest (e.g. anastomotic leak and pulmonary infection) and mortality.

**Conclusions:** IEN decreases wound infection rates and reduces length of stay. It can be recommended as routine nutritional support in upper GI surgery.

### Cancer/Surgical Oncology (GI) 0129

#### Lymph node harvesting and positivity ratio as prognostic indicators in gastric adenocarcinoma survival outcomes

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**Aims:** Nodal staging has been evolving for Gastric AdenoCarcinoma (GAC) as appreciated in 7th edition of AJCC/UICC staging system. Lymph node harvest (LNH) and lymph node positivity ratio (LNPR) have been previously suggested to be prognostic indicators both in oesophageal & gastric tumours. In an effort to develop a valid staging model, we compared the predictive value of LNH and LNPR to AJCC7 staging in a cohort of patients undergoing surgical resection for gastric adenocarcinoma.%

**Methods:** All consecutive patients who underwent radical gastrectomy with D2 lymphadenectomy for GAC during the period of January 2010 till April 2012 were included in the study. Patients were stratified according to nodal staging (N1-3). Survival functions were estimated using the Kaplan-Meier method, Log-rank test & Cox regression analysis where appropriate. Classification thresholds for both LNPR and LNH were derived by recursive partitioning resulting in subdividing patients into 2 groups with LNPR cut off point of 40%.

**Results:** 50 patients underwent radical surgery with curative intent. 8 patients had open and close operation with no resection and 5 had palliative bypass. Among the remaining 37 patients, 19 patients were N0, 5 were N1, 8 were N2 and 5 were N3 with median LNH of 17. The mean survival in the low LNPR (<40%) was 43 months (0-50 months), while in the high LNPR group (>40%), it was 25 months (6-34 months). There was a significant survival benefit at ( $p=0.046$ ) in low LNPR group. Cox regression analysis showed that Pathological T, N stages as well as histological grade were not independently associated with improved survival.

**Conclusions:** LNPR appears to be an important prognostic indicator and should be taken into consideration following resection gastric cancer surgery as well as the AJCC7 TNM classification when considering survival outcomes.

### Cancer/Surgical Oncology (GI) 0271

#### Prognostic value of neo-adjuvant chemoresponse on predicting post-operative complications in oesophageal cancer (EC) surgery and survival outcomes

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**Aims:** To determine the prognostic value of radiological response to neo-adjuvant treatment on postoperative complications following oesophagectomy and survival outcomes.

**Methods:** Retrospective analysis of patients diagnosed with potentially resectable oesophageal cancer between 1999-2012 was identified from a prospective collected database of patients within a regional UGI Cancer Network. Response to neo-adjuvant treatment was recorded radiologically using CT scan. Post operative complications were recorded using the Clavien-Dindo classification (CD) for all patients undergoing oesophagectomy following neo-adjuvant treatment. Primary outcome was postoperative complication grade and secondary outcome was survival. Statistical analysis using Chi square test, univariate and multivariate regression analysis were carried out. Kaplan Meier method and Log-rank test for survival data analysis.

**Results:** 274 patients were diagnosed with resectable oesophageal/junctional cancer during the study period. After staging and MDT discussion, 154 patients had neo-adjuvant chemotherapy before attempting surgical resection. Male/Female ratio was 4.3:1 (125/29). Mean age was 59.8 (36–74). Histology showed Adenocarcinoma/SCC ratio 5.4:1 (130/24). 22 patients were excluded from the analysis as 19 had open and close surgery while 3 did not proceed to surgery due to disease progression following neo-adjuvant treatment. The remaining 132 patients, 94 had transthoracic resection, 34 had transhiatal and 4 patients had 3 stage oesophagectomy. Of those 132 patients, 67 had radiological response to neo-adjuvant treatment while 65 showed no response. There was no significant difference in the survival between the 2 groups (mean survival 64.9 Vs 59.2 months,  $p=0.3$ ). 37 of the 65 patients (57%) in the no response group had CD grade 3 or 4 postoperative complications compared to only 19 out of 67 (28%) in the group who showed response ( $p=0.001$ ).

**Conclusions:** Our series show a significantly increased risk to develop major postoperative complications in non responders to neoadjuvant chemotherapy +/-radiotherapy. This should be discussed at the time of obtaining consent to surgery and has implications on postoperative management.

## Cancer/Surgical Oncology (GI) 0484

### Risk of oesophageal neoplasia in patients with Barrett's associated low grade dysplasia at index biopsy: A 10-year cohort study

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**Aims:** Barrett's oesophagus (BO) is the only recognised precursor for oesophageal adenocarcinoma (OAC). Accurate prediction of progression to high grade dysplasia (HGD) or OAC is important. The literature reports progression of low grade dysplasia (LGD) to HGD or OAC at 0.54% to 85%. Our study aims to determine the incidence of high grade dysplasia or oesophageal adenocarcinoma in patients with LGD at index biopsy.

**Methods:** Retrospective review was conducted of all patients diagnosed with LGD over a 10-year period from January 2003 to September 2014. Two specialist pathologists in Barrett's oesophagus and neoplasia reviewed all LGD biopsies. Patient demographics, progression to HGD or OAC, grade of endoscopist were recorded. Patients with HGD or OAC at index biopsy were excluded.

**Results:** 65 patients were identified with histopathological diagnosis of true LGD. 62% ( $n=40$ ) of these patients progressed to HGD or OAC in the 10-year period. Total mean follow-up for all patients who progressed was 19.2 months (95% CI 13.1 to 25.2). Mean time for progression of LGD to HGD or OAC was 12.5 months (95% CI 8.1 to 16.9). 25% ( $n=10$ ) of patients with LGD who progressed had their follow-up endoscopy performed by an endoscopist specialising in Barrett's. Mean time taken for progression from LGD to HGD or OAC when the follow up endoscopy was performed by a specialist was 9 months (95% CI 2.5 to 15.5) compared to a non-specialist follow up at mean of 14.9 months (95% CI 9.2 to 20.6)  $p=0.33$ .

**Conclusions:** The majority of patients with true LGD progressed to HGD or OAC. This study illustrates that the majority of true LGD do have neoplastic progression and a specialist follow up may be warranted for earlier diagnosis and treatment. This is consistent with recent NICE guidance for modern endoscopic treatments to be made available to patients with Barrett's associated LGD.

## Cancer/Surgical Oncology (GI) 0511

### Outcome after pancreaticoduodenectomy for T3 adenocarcinoma: a multivariable analysis from the UK Vascular Resection Study Group

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**Aims:** We performed a multivariable analysis to determine the factors associated with outcome in patients undergoing surgery for T3 resectable pancreatic cancer.

**Methods:** This is a UK multicenter retrospective cohort study assessing outcomes and risk factors in patients undergoing pancreaticoduodenectomy with venous resection (PDVR) and standard pancreaticoduodenectomy (PD). Nine high-volume UK centers contributed. All consecutive patients with T3 only adenocarcinoma of the head of the pancreas undergoing surgery between December 1998 and June 2011 were included. Multivariable logistic and proportional hazards regression analyses were performed to determine the association between the surgical groups and morbidity, in-hospital mortality and overall survival

**Results:** 1070 patients were included of whom 840 (78.5%) had PD and 230 (21.5%) had PDVR. Median age at surgery was 66 (range 27–84). There were no differences for in-hospital mortality (26/840 (4.6%) vs 10/230 (4.4%),  $p=1.00$ ) or median overall survival (18.48 vs 18.84 months,  $p=0.66$ ). Multivariable analyses identified R1 resection margin status (adjusted hazard ratio [aHR] 1.22,  $p=0.01$ ), N1 nodal status (aHR 1.92,  $p=0.0001$ ), perineural invasion (aHR 1.37,  $p=0.002$ ), tumour size  $\geq 20$  mm (aHR 0.63,  $p=0.0001$ ) and a re-laparotomy (aHR 1.84,  $p=0.0001$ ) to be independently associated with overall mortality. Factors associated with in-hospital mortality were a high creatinine (aHR 1.14,  $p=0.02$ ), post-operative bleeding (aHR 2.86,  $p=0.04$ ) and a re-laparotomy (aHR 8.42,  $p=0.0001$ ). Sensitivity analyses using a univariate model demonstrated this to be similar in the PDVR group when the PD group was excluded.

**Conclusions:** This largest study on T3 tumours suggests that the factors associated with poorer survival outcome in patients undergoing surgery for T3 tumours arise from histological assessment. Patients with these features are at a high risk of disease recurrence. Predictive pre-operative features are required to determine a subset of patients who might benefit from neo-adjuvant therapy.

## Cancer/Surgical Oncology (GI) 0657

### Surgeon level outcome reporting for Upper GI (UGI) cancer operative mortality: a view from over Offa's Dyke

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**Aims:** The UK National OG Audit 2014 reports 90-day mortality rates (MR) of 4.4% and 4.5% after oesophagectomy and gastrectomy respectively, but controversially the recently AUGIS-facilitated My Choices website reported median Trust MR of 1.7% (range 0–8), and a median surgeon level mortality rate (SLMR) of 0% (range 0–20). Data from Wales was not included and the aims of this study were to compare data from a South Wales regional UGI cancer network with that from England.

**Methods:** Over a 3-year period between April 1, 2011 and March 31, 2014, 170 consecutive patients [median age 66 (24–86) yr, 130 male, 80 neoadjuvant therapy] underwent surgery for UGI cancer by a multidisciplinary team (MDT) consisting of 6 specialist surgeons (3 in-reach) working at a single cancer centre from 4 NHS Local Health Boards (equivalent to English NHS Trusts). Primary outcome measure was death within 30 days of surgery, and when joint consultant team operating occurred the lead surgeon was identified (46%).

**Results:** The median number of resections performed by individual surgeons by year was 10 (5–25,  $p=0.855$ ), but when team operating was accounted for was 14 (5–25). The median annual SLMR was zero, but varied from 0 to 9.09%. Median Trust MR was 0% (0 to 7.14), and overall network MR by year was 1.8% (0 to 3.7,  $p=0.389$ ). Joint consultant team based procedures were not associated with any operative mortality ( $p=0.270$ ).

**Conclusions:** Surgeon level UGI cancer operative MRs from the South Wales UGI cancer network over a 3 year period were equivalent at both surgeon and Trust level to those reported from England. However, the greatest variation was observed in yearly SLMRs which may risk inappropriate target thresholds being set. Centre-based MR appeared less sensitive to caseload effect and is potentially more representative of the prevalent MDT approach.

## Cancer/Surgical Oncology (GI) 0662

**Prognostic significance of T (LNR) M in staging oesophageal cancer incorporating pathological lymph node ratio (LNR)**J. R. Wheat<sup>1\*</sup>, A. Powell<sup>1</sup>, D. Chan<sup>1</sup>, T. Reid<sup>1</sup>, W. G. Lewis<sup>1</sup><sup>1</sup>University Hospital of Wales, United Kingdom

**Aims:** Stage migration related to revised cancer staging definitions may result in artefact alterations in stage-defined survival and prognosis, termed the Will Rogers' effect. Lymph node ratio (ratio of LN metastases to total LN harvest, LNR) has been championed as a potential superior prognostic marker compared with pN stage in other GI site specific cancers and the aims of this study were to determine the relative prognostic value of TNM7 oesophageal cancer (OC) system, compared with TNM6; and examine the influence of incorporating LNR into a novel TNM staging system.

**Methods:** Consecutive 241 patients [median age 61 (35–79) yr; 189 ACA, 43 SCC, 183 male] undergoing oesophagectomy for cancer were studied. Patients originally classified and staged using TNM6 were retrospectively re-staged using TNM7, and LNR was calculated and scores subclassified as 0 (node negative), 1 (0.01–0.24), 2 (0.25–0.49) and 3 (> 0.50). The primary outcome was cumulative survival from the date of diagnosis and analysis was based on intention to treat.

**Results:** Cumulative 5 year survival progressively worsened as the LNR increased; 57% LNR 0 57%; LNR 1 29%; LNR 2 18%; and LNR 3 0%. Univariable analysis revealed pT stage (Chi 2 34.458, <0.001), p N (TNM 6) stage (Chi 2 35.157, <0.001), LNR (Chi 2 57.180, <0.001), pN (TNM 7) stage (Chi 2 59.277, <0.001), full TNM 7 stage (Chi 2 71.015, <0.001) and T(LNR)M (Chi 2 50.472, <0.001) to be associated with survival. On multivariable analysis only T (LNR) M was independently and significantly associated with survival: stage 1 (HR 1.471, 95% CI 0.502–4.313, <0.482); stage 2 (HR 1.894, 95% CI 0.663–5.410, <0.233); stage 3 (HR 5.003, 95% CI 1.826–13.709, <0.002); and stage 4 (HR 6.276, 95% CI 1.673–23.546, <0.006).

**Conclusions:** T (LNR) M is a better prognostic tool than both TNM6 and TNM7 staging systems and represents an important advance in staging oesophageal cancer.

## Cancer/Surgical Oncology (GI) 0664

**D2 gastrectomy related morbidity severity score predicts long term survival**J. Long<sup>1\*</sup>, J. R. Wheat<sup>2</sup>, C. Leaman<sup>1</sup>, X. Escofet<sup>1</sup>, W. G. Lewis<sup>2</sup><sup>1</sup>Royal Glamorgan Hospital, <sup>2</sup>University Hospital of Wales, United Kingdom

**Aims:** National post operative morbidity rates after D2 gastrectomy vary considerably but are often considered to be discrete events with no long term consequences for survival provided the patient is rescued and does not suffer operative mortality. Post-operative morbidity severity may be classified by the Clavien Dindo (CD) score and the aim of this study was to determine the prognostic significance of such morbidity on long-term survival.

**Methods:** Consecutive 335 patients [median age 70 (27–90) yr, 227 male, 41 neoadjuvant chemotherapy] undergoing modified D2 gastrectomy (preserving pancreas and spleen) for gastric adenocarcinoma were studied. Operative morbidity was graded using the CD score, and the primary outcome measure was survival.

**Results:** Overall operative morbidity was 24.2% (81 patients). The number (percentage) of patients by CD severity were; CD grade 0/I 254 (76%), CD II 46 (14%) CD III 12 (4%), CD IV 6 (2%), CD V (operative mortality) 17 (5%). Cumulative 5 year survival related to CD grade was 0/I 49%, II 49%, III 42%, IV 0% and V 0% (Chi 2 291.013, DF 4, <0.001). On multivariable analysis, lymph node metastasis ratio [HR 10.823 (4.967–23.580), <0.001] and Clavien Dindo graded morbidity [<0.001, HR 0.015–0.027 (0.003–0.141), <0.001] were independently associated with survival.

**Conclusions:** Clavien Dindo classified post operative morbidity severity grade is an important and independent prognostic indicator for patients undergoing modified after D2 gastrectomy for cancer.

## Cancer/Surgical Oncology (GI) 0670

**Oesophagectomy related morbidity severity score predicts long term survival**C. Leaman<sup>1</sup>, J. R. Wheat<sup>2</sup>, J. Long<sup>1</sup>, X. Escofet<sup>1</sup>, W. G. Lewis<sup>2</sup><sup>1</sup>Royal Glamorgan Hospital, <sup>2</sup>University Hospital of Wales, United Kingdom

**Aims:** The UK National Oesophago-Gastric Cancer Audit 2013 reports a contemporary post oesophagectomy morbidity rate of 32.3% which is often considered a discrete event with no associated long-term sequelae. Post-operative morbidity severity may be classified by the Clavien-Dindo (CD) score and the aim of this study was to determine the prognostic significance of morbidity on long term survival.

**Methods:** Consecutive 270 patients diagnosed with oesophageal cancer [median age 63 (24–79) yr, 210 male, 222 Adeno, 48 Squamous cell carcinoma, 150 neoadjuvant chemotherapy] undergoing oesophagectomy were studied prospectively. Morbidity was graded using the CD score and the primary outcome measure was survival from date of diagnosis, and based on intention to treat.

**Results:** Overall operative morbidity was 41.3%, (CD I 18.5, CD II 10.3, CD III 10.3, CD IV 1.8, CD V 0.4%). Cumulative 5 year survival related to CD score was; CD 0 37%, CD I 38%, CD II 28%, CD III 10%, CD IV 0%, and CD V 0% (Chi 2 19.827, DF 5, <0.001). On multivariable analysis, pT stage (HR 1.622 [95% CI 1.250–2.106], <0.0001), lymph node ratio (HR 7.057 [3.658–13.616], <0.0001), and CD graded morbidity (HR 0.066–0.869 [0.008–8.166], <0.0001) were independently associated with survival.

**Conclusions:** Clavien-Dindo classified post operative morbidity grade is an important independent prognostic indicator for patients undergoing oesophagectomy for cancer.

## Cancer/Surgical Oncology (GI) 0750

**Treatment Access and Survival Amongst British Asians with Pancreatic Cancer in the East Midlands**J. Isherwood<sup>1\*</sup>, D. Bilku<sup>1</sup>, M. Metcalfe<sup>1</sup>, A. Dennison<sup>1</sup>, G. Garcea<sup>1</sup><sup>1</sup>Department of Hepato-Pancreato-Biliary Surgery, Leicester, United Kingdom

**Aims:** Despite increasingly mixed communities in large cities there remains a paucity of absolute and comparative data concerning the treatment, access and survival of British Asians with pancreatic cancer.

**Methods:** A prospective database of 1038 patients with a diagnosis of pancreatic cancer from 2003 to 2012 was analysed. Asian/Asian British was defined as patients identifying themselves as originating from India, Bangladesh or Pakistan.

**Results:** No significant difference was observed in gender split for both Asian/Asian British and White British (AAB and WB). Age at presentation was significantly younger in AABs when compared to WBs (67 versus 70 years, p=0.003). Whilst median maximal tumour diameter, node status and the incidence of metastases was no different between AABs and WBs, the AABs had a significantly greater median T-stage (3.0 versus 2.5, p=0.0024). The percentage of patients referred for chemotherapy was significantly higher in the AAB group (70.5% versus 47.7%, p=0.0015). Overall survival and survival for patients having palliative treatment was significantly greater in AABs (4.6 versus 6.1 months and 3.7 versus 5.1 months).

**Conclusions:** This study demonstrates that AAB patients present with pancreatic cancer at a younger age and when receiving palliative chemotherapy their survival is significantly better. Further studies and larger data sets over a longer period are required. It is important to examine further the complexity of incidence and survival in ethnic minorities and investigate the underlying reasons when differences are demonstrated.

## Cancer/Surgical Oncology (GI) 0857

**Oesophageal Perforation: 5 years experience of surgical management at a specialist unit**H. Saeed<sup>1\*</sup>, A. K. Mirza<sup>1</sup>, I. Welch<sup>1</sup>, S. W. Galloway<sup>1</sup><sup>1</sup>The University Hospital of South Manchester, United Kingdom

**Aims:** The diagnosis and management of oesophageal perforation is challenging and there is variation in practice. Both the surgical and conservative approaches are applied depending upon patient general state and co-morbidities. Our aim was to review the management of patients diagnosed with oesophageal perforation at a specialist unit.

**Methods:** The data was reviewed over period of five years (2009 to 2014) for patients who have been diagnosed and managed for oesophageal perforation. Mode of presentation, in-hospital stay, surgical versus conservative management, 30 day morbidity and mortality and final outcome were recorded.

**Results:** 27 patients (Male 20, Female 7) were identified who underwent management of oesophageal perforation (spontaneous perforation = 2, endoscopic instrumentation = 4, perforated oesophageal cancer = 1, vomiting and Boerhaave's syndrome = 20) with median age of 57 years (range, 18–87 years). All patients had intravenous contrast CT scan and 16 (60%) also had oral contrast CT scan. 17 (63%) patients were treated in intensive care and 9 (37%) patients were managed on the wards. 7 (25%) patients required thoracotomy with closure over a chest T-tube and chest drain. 20 (75%) patients were treated with aggressive but nonsurgical management (nil by mouth, intravenous antibiotics, antifungals, proton pump inhibitors and total parenteral nutrition). Median in-hospital and intensive care stay were 18 (range 12–35) and 11 (range 5–27) days respectively. 30 day in-hospital mortality was 5 (20%), respiratory complications (n = 11, 40%), systemic sepsis (n = 7, 25%) and multiorgan failure (n = 5, 20%).

**Conclusions:** Oesophageal perforation is associated with significant morbidity and mortality. Early recognition and input from a specialist unit can improve the outcome. In stable patients with no overt sign of systemic sepsis conservative approach can improve the outcome.

## Cancer/Surgical Oncology (GI) 0915

**The value of adjuvant chemotherapy in oesophago-gastric cancer**J. H. Saunders<sup>1\*</sup>, C. R. Bowman<sup>1</sup>, S. Madhusudan<sup>1</sup>, I. Soomro<sup>1</sup>, S. L. Parsons<sup>1</sup><sup>1</sup>Nottingham University Hospitals NHS Trust, United Kingdom

**Aims:** For patients with operable oesophago-gastric cancer, the MAGIC chemotherapy regimen confers a significant overall survival benefit, and is widely regarded as the standard of care in the UK. It consists of 3 cycles of ECX chemotherapy (epirubicin, cisplatin/oxaliplatin, 5-fluorouracil/capecitabine) both pre and post operatively. However despite the proven overall survival benefit, only approximately 40% of patients show a demonstrable histopathological response. It is unclear whether those with no response to neoadjuvant chemotherapy should go onto receive adjuvant chemotherapy, as no further benefit may be conferred.

**Methods:** A retrospective observational cohort study was performed, identifying patients with operable oesophago-gastric cancers at regional cancer centre (Aug '06 - Feb '13) who were treated with MAGIC chemotherapy and had a histopathological tumour regression grade (TRG) reported (n = 333). This cohort (gastric = 58, GOJ = 157, oesophageal = 118) was interrogated using Kaplan-Meier and COX regression analysis.

**Results:** Following neoadjuvant chemotherapy and surgery, patients with chemotherapy responsive (TRG 1–3) cancers (n = 129), who were administered adjuvant chemotherapy (54.3%, n = 70) gained a significant overall survival benefit. (Log-rank p = 0.045). Whilst accounting for the effect of chemo-response, multivariate COX regression also revealed nodal yield as having a significant effect on the overall survival (fully adjusted HR, 0.643; 95% CI 0.28–1.13).

In contrast, patients with non-responsive (TRG 4–5) tumours (n = 204), that subsequently underwent adjuvant chemotherapy (58.3%, n = 119), did not show any survival benefit (Log-rank, p = 0.72).

Drug toxicity from the triple agent ECX regimen was prevalent, and contributed markedly to only half of the patients receiving adjuvant chemotherapy.

**Conclusions:** These results suggest the benefit of the adjuvant portion of MAGIC chemotherapy is limited to those patients whose tumours demonstrate a histopathological response to neoadjuvant chemotherapy. The administration of the adjuvant portion of chemotherapy to patients without a demonstrable response to neoadjuvant chemotherapy may not provide any survival benefit, whilst potentially causing increased patient morbidity.

## Cancer/Surgical Oncology (GI) 0958

**Long Term Oncological Outcomes following Totally Laparoscopic Gastrectomy for cancer in a Western Population**H. T. Malik<sup>1\*</sup>, A. Parker<sup>1</sup>, A. Menon<sup>1</sup>, K. Akhtar<sup>1</sup>, S. Senapati<sup>1</sup><sup>1</sup>Hope Hospital, United Kingdom

**Aims:** Minimally invasive approaches (often laparoscopic-assisted) have gained popularity in Asian populations especially for early gastric cancers with favourable long term efficacy. However in the West, the application of laparoscopic techniques have been slowly adopted comprising only 18% of all gastrectomies in the recently published National Oesophago-gastric clinical audit in England. 1

Furthermore, controversy exists as to the feasibility and oncologic efficacy of totally laparoscopic procedures for advanced gastric cancer; due to insufficient evidence.

We present 10 years experience of totally laparoscopic gastric resection for operable gastric cancer. All patients had either subtotal or total gastrectomy with modified D2 lymphadenectomy depending on tumour location.

**Methods:** A retrospective review of a prospectively collected database was conducted to identify the clinical outcomes of 111 consecutive patients who underwent laparoscopic resection of gastric cancer between July 2004 and November 2014. The endpoints being overall survival (OS) and recurrence free survival (RFS).

**Results:** Of 111 patients the male to female ratio was 1 (55 males and 56 females). The mean age was 73 years (range 43–91). The rate of conversion was 16% (n = 18). Post-operative morbidity occurred in 17% of cases, and mortality in 4% within 30 days.

Of 111 patients, 84 patients underwent totally laparoscopic subtotal gastrectomy with 27 undergoing laparoscopic total gastrectomy. The median follow up period was 63 months (range 2–125). Overall survival at one, three and five years was 84%, 60% and 41% respectively where as recurrence free survival was 86%, 68% and 63% at one, three and five years respectively.

**Conclusions:** Totally laparoscopic gastrectomy is technically feasible with acceptable morbidity and mortality. This study has demonstrated long-term outcomes comparable to open gastric cancer surgery published in western literature. We think it is time for a multicenter randomised controlled trial for all operable gastric cancers being performed either by open or minimal invasive surgery.

## Cancer/Surgical Oncology (GI) 0965

**An Outline of Barrett's Oesophagus in Ireland: Preliminary Data from a Collaborative Multicentre Registry in Ireland**J. Witherspoon<sup>1\*</sup>, N. Ravi<sup>1</sup>, D. O'Toole<sup>1</sup>, J. O'Sullivan<sup>1</sup>, J.V. Reynolds<sup>1</sup><sup>1</sup>National Oesophageal and Gastric Cancer Centre, James's Hospital/Trinity College Dublin

Ireland

**Aims:** Barrett's oesophagus (BO) is prevalent in societies in the West, and is the sole pathological precursor of adenocarcinoma. We present preliminary data from the first national database for Barrett's oesophagus (BO) in the Republic of Ireland.

**Methods:** The registry was established in 2008 and includes 5 University teaching Hospitals (3 in Dublin, 1 each in Cork and Galway). Prospective clinical, pathologic and follow-up data are provided by data managers, and biopsies are bioresourced for translational studies.

**Results:** 3256 (2167 males) patients with endoscopic BO and pathological specialized intestinal metaplasia (SIM) are registered. Table 1 shows the index diagnosis and the % of patients who had histopathological stability/regression/progression over the study period. Patients with HGD were excluded from the progression analysis as they were actively treated. 40.7% had short segment BO, 25.6% had 3–10 cm BO, 2.6% had 11–15 cm BO, 0.2% had 15–20 cm BO, and 0.2% had >20 cm BO. 125 patients have undergone endotherapy and 70 patients have had oesophagectomies.

**Conclusions:** Disease registries provide a valuable resource in tracking clinical and epidemiological data in a population and registries. Progression is more common in this registry from specialist centres than in population-based registries 1-2.

## Cancer/Surgical Oncology (GI) 0983

### Relative Cost per Life-year Gained of Treatments with Curative Intent for T3NXM0 Upper Gastrointestinal Cancer

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**Aims:** The treatment of patients with upper GI cancer imposes a substantial financial burden on the NHS. Survival with best supportive care (BSC) is poor. Oesophagectomy, gastrectomy and definitive chemoradiotherapy (dCRT) are all offered to patients with locally advanced (T3) disease, with curative intent. The aim of this study was to determine the cost of each treatment per life-year gained compared with BSC.

**Methods:** Costs to the NHS for 1 year of treatment from referral were calculated according to locally agreed diagnostic, staging and treatment pathways for patients undergoing oesophagectomy, gastrectomy or dCRT. Costs were calculated from national reference costs, published staff and medication costs, and activity-based costing.

Overall survival from diagnosis was derived from a prospectively maintained database of all patients treated via a centralised regional MDT. Patients with T3 oesophageal or gastric disease (n = 621) were selected, and grouped per treatment modality according to intention to treat: oesophagectomy with neoadjuvant chemotherapy; gastrectomy with or without peri-operative chemotherapy; or dCRT.

**Results:** Median survival with T3 oesophageal cancer with BSC is 8 months (0.25–57), which costs £7426. Patients undergoing oesophagectomy survived a median of 24 months from diagnosis, costing £18,270 for 1 year's treatment and follow-up. Cost per life-year gained = £8133.

After dCRT, patients survived a median of 23 months from diagnosis. dCRT costs £17,462 for 1 year's treatment and follow up. Cost per life-year gained = £8029.

Median survival for T3 gastric cancer with BSC is 5 months, which costs £4861. Patients undergoing gastrectomy survived a median of 24 months from diagnosis, costing £17,516 for 1 year's treatment and follow-up. Cost per life-year gained = £7993.

**Conclusions:** Both surgery and oncological therapy for T3 disease with curative intent improve overall survival considerably compared to BSC. All three treatment modalities are likely to be cost-effective at nationally accepted thresholds of willingness to pay per QALY.

## Cancer/Surgical Oncology (GI) 0998

### Experience of the Republic of Ireland Collaborative Registry from Specialist Centres of over 3000 patients highlights higher rates of Barrett's progression than Population Registries

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**Aims:** We developed a registry of Barrett's Oesophagus (BO), specifically specialized intestinal metaplasia (SIM), from 5 university academic centres, and herein report incidence rates of progression to high grade dysplasia (HGD), and oesophageal adenocarcinoma (OAC).

**Methods:** Prospective clinical, pathologic and follow-up data are provided by data managers using a web-based integrated database (Dendrite, UK). Incidence of progression was calculated as events per 100 person-years (% per year) of follow-up. Patients with HGD/OAC at index biopsy were excluded. Incidence rates were compared with recently published population registries from Northern Ireland and Denmark 1,2.

**Results:** 3,256 (2167 males) patients with endoscopic BO and pathological SIM were registered. 194 patients with HGD/OAC on index biopsy were excluded. Table 1 shows the incidence of progression in BO.

The absolute annual risk of progression to OAC was 0.93%, 0.22%, 0.29% for the Republic of Ireland, Northern Ireland and Denmark registry respectively. The incidence of progression of any kind for all patients in the database (n = 3,256) was 2.76% per year.

**Conclusions:** Disease registries provide a valuable resource in tracking clinical and epidemiological data. Progression is more common (4-fold) in this registry from specialist centres than in population-based registries 1,2. These data highlight this difference, and emphasizes the potential high risk of LGD defined by strict pathological criteria in specialist centers.

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## Cancer/Surgical Oncology (GI) 1038

### Early experience from Endotherapy for Dysplasia in Barrett's Oesophagus in a Tertiary Centre in the Republic of Ireland

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**Aims:** Endoscopic surgery and radiofrequency ablation (RFA) have enhanced a minimally-invasive curative approach to high-grade dysplasia (HGD) and early mucosal cancers arising in Barrett's oesophagus (BO). Recent evidence shows a benefit in treating low-grade dysplasia (LGD) in addition to HGD 1. We report the experience from the National Oesophageal and Gastric Cancer Centre in Ireland.

**Methods:** All patients undergoing RFA, endoscopic mucosal resection (EMR) and argon plasma coagulation (APC) from 03/2009–10/2014 were analysed. Demographics, index Vienna grade, treatment, and outcome were collected prospectively by a database manager. The programme involves histopathological confirmation by 2 independent pathologists, diligent lesion resection to achieve flat BO, and quarterly ablation therapy until specialized intestinal metaplasia (SIM) free on 2 occasions following a maximum of 5 ablation sessions.

**Results:** 125 patients were treated (100 M), median age 65 years. 22 patients had ablation for LGD. The majority (51%) of patients had 1 session of circumferential balloon ablation (HALO 360 o), 8%, 2.4%, 38.5 had 2, 3, and no sessions respectively. 24.6% had 1 session of focal ablation (HALO 90 o), 36.5%, 25.4%, 2.4%, 1.6% and 8.7% had 2, 3, 4, 5 and no sessions respectively (average number of sessions = 2.7). Of 103 patients with HGD/IMC, 79 completed therapy, 4 failed, 5 had persistent SIM, 3 were lost to follow-up and 12 remained within the programme. Of 22 patients with LGD, 10 completed therapy, 11 were within the programme and 1 failed (CR-D = 95%, CR-IM = 90%).

Six patients (4.8%) required dilatation for endotherapy-induced strictures. Three patients had post-EMR bleeding; 2 required hospitalization and 1 required transfusion. 54 patients had EMR pre-RFA treatment, 28 peri-RFA and 24 patients had APC. 4 patients progressed to resectional surgery and one underwent Nissen fundoplication and further HALO.

**Conclusions:** Endotherapy is becoming the mainstay of therapy for dysplasia in BO. Our outcomes are comparable with international expert centres.

## Colorectal Cancer

### Cancer/Surgical Oncology (GI) 0092

#### Exercise training response is associated with greater tumour regression in rectal cancer following neoadjuvant chemoradiotherapy

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**Aims:** Patients with resection margin threatened rectal cancer receive neoadjuvant chemoradiotherapy (NACRT). Whilst NACRT improves overall survival, novel data from our group have shown it to cause deterioration in physical fitness which can be ameliorated by exercise training. We hypothesized that exercise would provide further benefit in the tumour response to NACRT.

**Methods:** 30 patients (20 male) with T3/N+ resection margin threatened rectal cancer who completed standardized NACRT were prospectively recruited. All patients underwent baseline cardiopulmonary exercise testing (CPET). Patients were allocated to exercise or contemporary control groups. The exercise group (n=21, 11 male) underwent interval training between week 0 (completion of NACRT) and week 6. All patients underwent CPET at week 0, 3, 6, 9 and 14. All patients had staging MRI pre-NACRT and at week 14 post-NACRT. Images were assessed in a blinded fashion using MRI Tumor Regression Grading (mrTRG).

**Results:** Comparing the exercise and control groups ((mean (SD) age exercise 64 ± 10 vs. control 71 ± 8 years), the difference in mrTRG grade did not reach significance (mean exercise; 2.2 ± 1.4, mean control 3.2 ± 1.5, p = 0.072). However, the exercise group shows variable response to training as measured by change in oxygen uptake at estimated lactate threshold (Vo 2 at LT) from week 0 to week 9. Employing a minimum clinically important difference (MCID) of +2.0 ml.kg<sup>-1</sup>.min<sup>-1</sup> in Vo 2 at LT to define an exercise 'responder' (n = 10, 3 male), there was a significant difference in mrTRG between 'responders' and controls (mean 2.0 ± 0.95 vs. 3.2 ± 1.5, p = 0.048). No differences in baseline characteristics were found. In exercise 'responders', there was a strong correlation between change in Vo 2 at LT from week 0 to week 9 and mrTRG at week 14 (r = -0.77; p = 0.008).

**Conclusions:** Patients who sustain a clinically important response to training have a significant decrease in mrTRG compared to controls.

### Cancer/Surgical Oncology (GI) 0109

#### Primary to secondary care referral experience of suspected colorectal malignancy in young adults

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**Aims:** Patients younger than 50 diagnosed with colorectal malignancy is slowly increasing in the UK with limited national guidance available recommending indications for secondary care referral. Our study aims were to be the first to report colorectal cancer incidence in patients under-50 referred to secondary care with suspected malignancy and to analyse the quality of primary care referrals made.

**Methods:** All referrals made from primary care to a UK district general hospital for suspected lower gastrointestinal cancer in patients younger than 50 between December 2008 and May 2014 were retrospectively analysed. Further data were collected on subsequently diagnosed malignancies including presenting symptoms, tumour characteristics and clinical outcomes. Each referral was scored out of 9 points (Referral Performance Score, RPS) dependant on relevant information documented.

**Results:** 197 referred patients were identified (median age, 41.5 years). 18 (9.1%, 11 male and 7 female) were subsequently diagnosed with colorectal cancer. These malignancies referred from primary care represented only 48.6% (18/37) of all patients under-50 diagnosed with colorectal cancer over the study period. Abdominal pain was the only presenting symptom to manifest more in malignant patients compared with non-malignant patients referred (44.4% vs 21.8% respectively, p=0.042). Tumours were mostly distal to the splenic flexure (89%) and moderately differentiated (94%). Median time period between referral date and colorectal surgeon review was 11 days (IQR, 7–13) and median RPS was 5 out of 9 (range 3–9).

**Conclusions:** Malignancy is not uncommon in those patients under-50 referred for suspected colorectal cancer to secondary care. Those referred with abdominal pain in the presence of other high-risk lower gastrointestinal symptoms are more likely to have malignancy. Major deficiencies are apparent in GP referrals to secondary care that has potential to affect further management. Further national guidance is much needed to aid early diagnosis of colorectal cancer in the young.

### Cancer/Surgical Oncology (GI) 0221

#### Preoperative MRI staging in rectal cancer compared to postoperative pathology after neoadjuvant therapy

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**Aims:** To determine the accuracy of MRI in staging cancer rectum in cases who had neoadjuvant therapy.

**Methods:** A retrospective review was carried out on 56 patients with cancer rectum treated between January 2008 and May 2013. All patients had preoperative MRI staging followed by short- or long-course neoadjuvant therapy. Patients who had downstaging chemoradiation were re-staged with another MRI scan just before the operation. Postoperative histopathological assessment and staging were done according to the TNM staging system and compared with the preoperative MRI according to the same classification to determine the accuracy of the MRI in such cases.

**Results:** Overall, sensitivity of MRI to detect T1 + T2 was 57%; T3 58% and to T4 was 50%. In general, the accuracy of MRI to identify invasion to peri-rectal fat, LN, metastases and invasion to adjacent organ was 62.5%, 55% and 93% respectively. As regard the group treated with neoadjuvant short-course radiotherapy, the MRI accuracy was 61%, 58%, 97% for the same three items; while it was 67%, 50%, 89% for the group of long-term chemoradiation. High-, mid- and low-cancers showed values of 55-65%, 70% and 61.1% when compared regarding invasion of peri-rectal fat; while the percentage was 61.1%, 55%, 50% for lymph node metastases; and 94.4%, 90%, 94.4% when the invasion of adjacent structures was matched. Finally, males and females revealed nearly equal results when the same items were compared.

**Conclusions:** Magnetic resonance imaging is a reliable imaging modality for preoperative staging of cancer rectum according to the TNM stage. Not only cases of extra-rectal spread, which may require preoperative radiation therapy, can be identified, but also patients with minimal or no sphincter-sparing surgery in whom sphincter-sparing surgery may be considered.

In addition, MRI assessment is effective in re-evaluating cancer rectum cases after neoadjuvant chemoradiotherapy, although circumferential resection margin involvement errors may occur.

### Cancer/Surgical Oncology (GI) 0360

#### Muscle Depletion Predicts Survival After Curative Elective Colorectal Cancer Surgery

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**Aims:** Muscle depletion is characterized by a reduced muscle mass (myopenia) and increased infiltration by inter- and intramuscular fat (myosteatosis). This study aims to determine the role of muscle depletion as a prognostic marker for patients with colorectal cancer (CRC) undergoing curative resection.

**Methods:** 805 patients diagnosed with CRC undergoing elective surgical resection between 2006 and 2013 were included. Image analysis of CT scans was used to calculate Lumbar skeletal muscle index (LSMI), and mean muscle attenuation (MA). Reduced LSMI (myopenia) and low MA (myosteatosis) were defined using predefined sex-specific skeletal muscle index cut-points. Univariate and multivariate Cox regression models were used to determine the role of muscle depletion after stratification by several clinicopathological factors. Patients were followed by a standardized protocol until May 2014.

**Results:** Median follow-up was 38 months [interquartile range, 21–58]. Multivariate Cox regression analysis identified myopenia but not myosteatosis as an independent prognostic factor for disease-free survival (DFS) (odds ratio = 1.72; 95% confidence interval = 1.11–2.69;  $P=0.02$ ) and for overall survival (OS) (odds ratio = 1.48; 95% confidence interval = 1.04–2.12;  $P=0.03$ ). Older age, higher UICC stage, the presence of microvascular invasion and poor grade of tumour differentiation were also independent predictors of OS and DFS.

**Conclusions:** For patients with colorectal cancer, myopenia may be an independent prognostic factor for survival. Considering this in addition to well-established prognostic variables may improve the processes of identifying patients at higher risk of recurrence who would benefit from adjuvant therapies or more frequent surveillance. Muscle depletion is a common feature of all chronic pathologies but may represent a modifiable risk factor in cancer patients. The advent of the concept and application of 'prehabilitation' is relevant and early identification of low muscularity may permit timely therapeutic intervention prior to and after surgery.

## Cancer/Surgical Oncology (GI) 0567

### Colonic Stenting for Obstructing Colorectal Malignancy. A Worthwhile Option?

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South Tees NHS Trust

**Aims:** Colonic stenting has been widely used to treat colonic obstruction both as a palliative measure and a bridge to definitive surgery. Our institution serves a population of 1.1 million and colonic stenting has been performed since 2005. We aim to evaluate our experience when treating obstructing colonic tumours.

**Methods:** All 92 patients who received colonic stenting for obstructive colorectal malignancy between January 2005 and the present were included in this study from our prospective database (radiology, histology reports and our MDT proforma.) An analysis of demographic data, complications encountered, role of adjuvant therapy and outcomes were performed.

**Results:** The average age at stent insertion was 62.7 years (42–88 years). 57 males and 35 females. Survival following stenting was measured in days. 82 patients died within our study period. Mean survival of these being 295.8 days. (5–2,535).

Adjuvant treatment in the form of chemotherapy was administered in 39/92 (42.4%). With both first and second line chemotherapy agents being used. Mean survival in days following chemotherapy treatment was 186.2.

Palliative stenting remained common practice with 44/92 (47.78%). Unsurprisingly they had the shortest mean survival. Stenting as a bridge to curative surgery was used in 9/92 (9.7%). Histopathology confirmed the presence of Dukes B or Dukes C carcinoma. They received successful surgery and had survival significantly outstripping the others.

Complications recorded during stenting included technical failure of stent insertion, slippage or stent falling out, perforation and stent blockage. 8/92 (8.67%) required emergency surgery following stenting.

**Conclusions:** Our experience with colonic stenting suggests it has a role in the treatment of an obstructing colorectal malignancy. What remains unclear is the role of chemotherapy in these patients. Currently our institution is undergoing further research to determine if chemotherapy offers a survival advantage to those undergoing stenting. Hopefully the results of the CReST trail will support our findings.

## Cancer/Surgical Oncology (GI) 0583

### International variations in colorectal cancer mortality: faecal occult blood tests matter

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**Aims:** Colorectal cancer is a common cause of death worldwide, however, current trends are unclear. We aimed to establish international trends in colorectal cancer mortality and to identify associations with national uptake of screening.

**Methods:** Mortality data was extracted from the World Health Organisation (WHO) mortality database 2001–2010 using ICD codes C18–20 and age standardised to the world standard population. Trends in age standardised mortality (ASM) were then calculated. Proportion (%) of each population supplying faecal occult blood tests (FOBT) were then extracted from the European health indicators survey (2006–2008) and linear regression performed to identify associations with trends in mortality. After exclusion of countries based on completeness of data, twenty-six European countries were included.

**Results:** Colorectal cancer mortality is generally declining, however, variation is seen between countries and genders. Male ASM trends ranged from -1.7 in the Czech Republic to +0.7 in Croatia. Female ASM trends ranged from -1.0 in the Czech Republic to +0.2 in Croatia and Romania. Male mortality increased in 8 countries and fell in 16 whilst female mortality increased in 2 countries and declined in 22. FOBT uptake was highest in Germany for both males and females (52.1% and 56.3% respectively) and lowest in Romania (2.4% and 1.5%). A significant negative linear association was demonstrated between the proportion of people undergoing a FOBT and trends in mortality in both males ( $R^2=0.43$   $P=0.01$ ) and females ( $R^2=0.46$   $P=0.01$ ).

**Conclusions:** This population level ecological regression suggests that mortality from colorectal cancer is generally declining, however, variation exists and is associated with the uptake of colorectal cancer screening. By improving the uptake of faecal occult blood testing countries could further reduce colorectal cancer mortality in the future.

## Cancer/Surgical Oncology (GI) 0600

### Early Outcomes of the Irish Bowel Cancer Screening Programme in the South Eastern Region

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**Aims:** Bowel Screen, the national colorectal screening programme was introduced in the Southeast area (population circa 460,800) in 2013, expanding to a second screening unit within the region in 2014. We report on the outcomes of this programme and in particular the patient cohort referred for surgery to the regional cancer centre at University Hospital Waterford (UHW) so far.

**Methods:** All subjects eligible to participate in the Bowel Screening programme (age 60–69) in the South East Region were included in the study from March 2013 to September 2014. Subjects are invited to submit a stool sample for faecal immunochemical testing (FIT); patients with positive results are invited for colonoscopy. Demographic data were retrieved from the prospectively maintained National Bowel Screen database. Data collected was regarding polyp morphology, number of cancers detected, cancer type and location, radiological and histo-pathological stage and outcomes of surgery.

**Results:** In total, 34,834 people were invited to participate in South East Bowel Screen. Uptake was 42% (19,910) 5–12% of screening FIT tests were positive. Five hundred and twenty-five colonoscopies were performed; 237 polyps were discussed at the multidisciplinary team meeting. Nineteen patients were referred to UHW. Two of these patients had complete excision of polyps and were referred to the colonoscopy surveillance programme. One patient had advanced disease and was referred to palliative services. Sixteen patients underwent surgical resection. 68% had stage I–II disease representing surgically curative disease. Resection margins were clear (R0) in all cases.

**Conclusions:** Uptake of screening in the region has been comparable to previous colorectal screening programmes. All cancers, bar one, were diagnosed at an early stage, allowing for curative resections as a direct result of the South East Bowel Screen programme.

## Cancer/Surgical Oncology (GI) 0687

**The Relationship Between Pre-Diagnosis Use of Aspirin and Statins And Tumour and Host Characteristics in Patients with Colorectal Cancer**S. K. Ng<sup>\*</sup>, J. H. Park, C. S. Roxburgh, P. G. Horgan, D. C. McMillan*Academic Unit of Surgery, School of Medicine, College of Medicine, Veterinary and Life Sciences*

**Aims:** Aspirin and statin use has been associated with improved survival following a diagnosis of colorectal cancer (CRC). The underlying mechanisms remain unclear, however may reflect a direct effect of these drugs on either the tumour itself or host characteristics, such as cancer-associated systemic inflammation. The aim of the present study was to examine the relationship between pre-diagnosis aspirin and statin use, tumour and host characteristics in patients undergoing potentially curative CRC resection.

**Methods:** Patients were identified from a prospectively collected database of colorectal cancer resections performed in a single unit (2010–2014). The relationship between pre-diagnosis aspirin and statin prescribing, clinicopathological characteristics and systemic inflammatory responses, using the modified Glasgow Prognostic Score (mGPS 0 - CRP  $\leq$  10 mg/L; 1 - CRP > 10 mg/L and albumin  $\geq$  35 g/L; 2 - CRP > 10 mg/L and albumin < 35 g/L) was examined.

**Results:** 446 patients were available for analysis. Almost two thirds were older than 65, 57% were male and 68% underwent resection of colon cancer. 120 patients (27%) were prescribed aspirin and 187 (42%) statins prior to diagnosis with 100 patients prescribed both medications. Both drugs were associated with advancing age and male sex. Aspirin use was associated with a lower pre-operative CRP (median 3.3 mg/L vs. 5.1 mg/L,  $P=0.04$ ). Furthermore, fewer patients prescribed aspirin had a CRP > 10 mg/L (16% vs. 29%,  $P=0.006$ ) or elevated mGPS ( $P=0.007$ ). Statin use was not associated with CRP or mGPS. Aspirin and statin use was not associated with TNM stage, differentiation or venous invasion. However, when analysis was restricted to patients with stage II disease, both drugs, either alone or in combination, were associated with less VI (aspirin: 49% vs. 71%,  $P=0.006$ ; statin: 53% vs. 74%,  $P=0.004$ ; both vs. none: 45% vs. 75%,  $P=0.001$ ).

**Conclusions:** The present results suggest that aspirin and statin use may improve survival of patients with CRC through a reduction in VI and/or normalisation of host systemic inflammatory responses.

## Cancer/Surgical Oncology (GI) 0698

**The Relationship Between the Tumour Microenvironment, Early Metastases and Survival of Patients With Primary Operable Colon Cancer**J H Park<sup>1\*</sup>, C S Roxburgh<sup>1</sup>, P G. Horgan, D. C. McMillan*Academic Unit of Surgery, School of Medicine, College of Medicine, Veterinary and Life Sciences*

**Aims:** The tumour microenvironment may facilitate early metastatic spread in patients with colon cancer, as evidenced by the presence of venous invasion (VI), lymphatic invasion (LI) and perineural invasion (PI), collectively termed VELIPI. The aim of the present study was to examine the relationship between the tumour microenvironment, VELIPI and survival in patients with colon cancer.

**Methods:** 232 patients who had undergone primary colon cancer resection in a single institute were studied. The presence of VELIPI was obtained from pathology reports; VI was identified using elastica staining whereas LI and PI were identified using H&E sections. The local inflammatory cell infiltrate and tumour-associated stroma were assessed using Klintrup-M&uml;kinen (KM) grade and tumour stroma percentage (TSP) respectively.

**Results:** Over two thirds of patients were older than 65, 52% were male and 87% underwent elective surgery. 5% of patients had stage I, 66% stage II and 30% stage III disease. VI, LI and PI were present in 38%, 9% and 13% of tumours respectively. KM grade was not associated with VELIPI, whereas a high TSP was associated with the presence of VI and PI (both  $P<0.01$ ) but not LI. The presence of VELIPI, weak KM and high TSP were all associated with poorer cancer-specific survival (all  $P<0.01$ ). The prognostic utility of VELIPI was improved by stratifying patients by the number

of components present (5-year survival: VELIPI = 0–79%, VELIPI = 1–73%, VELIPI  $\geq$  2–49%;  $P<0.001$ ). Furthermore, on multivariate analysis, 'stratified' VELIPI was associated with survival (HR 1.50, 95% CI 1.14–1.98,  $P=0.004$ ), independent of age ( $P<0.001$ ), peritoneal involvement, TSP and KM grade (all  $P<0.05$ ).

**Conclusions:** The present study suggests that the tumour microenvironment, particularly the tumour-associated stroma, plays a role in the progression of early metastatic spread. Furthermore, assessment of VELIPI, alongside KM grade and TSP, hold independent prognostic value in patients with primary operable colon cancer.

## Cancer/Surgical Oncology (GI) 0736

**Faecal Occult Blood Testing (FOBT) and Interval Bowel Cancers - Are we ignoring an Elephant in the Room? - Results of a Multicentre Study**A. George<sup>1\*</sup>, S. Aggarwal<sup>2</sup>, A. Menon<sup>2</sup>, R. Logan<sup>3</sup>, A. Field<sup>3</sup><sup>1</sup>Royal Derby Hospital, Derby, <sup>2</sup>KingsMill Hospital, Sutton-in-Ashfield, Nottingham, <sup>3</sup>Bowel Cancer Screening Programme, Nottingham

**Aims:** To assess the incidence and demographics of interval cancers (cancers diagnosed within 2 years of negative FOBT screening) in the eligible population of the East Midlands region.

**Methods:** National Bowel Cancer Audit Programme data from three centres for all colorectal cancers in the screening age group (60–74 years) over a 2-year period (August 2011–2013) were linked for their FOBT screening status (BCSP database/Eastern Hub). Three groups were identified: interval cancers, screen detected (positive FOBT) and non-uptake (patients who declined screening). All three centres were in incident rounds of screening.

**Results:** Of the 521 colorectal cancers identified, 128 (25%) were interval cancers, 162 (31%) were screen detected and 231 (44%) were from the non-uptake group. The mean age in the interval cancer group was greater (68 yrs) compared to the screen detected (66 yrs) ( $p=0.005$ ). The interval cancer group had a higher incidence of right sided cancers (38% vs 25% & 29%;  $X^2=6.59$ ;  $p=0.033$ ) and a more advanced stage (Dukes C/D) (70% vs 34% & 54%;  $X^2=37.2$ ;  $<0.005$ ) in comparison to screen-detected and non-uptake groups. Over a median follow-up period of 31 months (range 16–46 months; SD 7.2 months) the mortality in the interval cancer group (27%) was comparable to the non-uptake group (27%) but 4 times higher than the screen detected group (7%;  $X^2=21.3$ ;  $<0.005$ ). Gender and ethnicity were comparable between the three groups.

126 (98%) of the interval cancer group had underlying ongoing 'red flag' symptoms with anaemia (mean Hb 10.3 gm; MCV 82.4; MCH 26.3) being present in 36 (28%) patients. Median time from the negative FOBT to the diagnosis of colorectal cancer was 15 months (range: 1–24 months).

**Conclusions:** A quarter of cancers identified in our screening population were interval cancers. This group was associated with poorer outcomes when compared to the screen-detected group and the majority had concomitant red flag symptoms. This highlights the limitations of the guaiac-based FOBT screening and that a negative test should not falsely reassure patients or doctors.

## Cancer/Surgical Oncology (GI) 0737

**The Value of CT Colonography to Guide Laparoendoscopic Excision of Early Colonic Neoplasia**A. Currie<sup>\*</sup>, E. Mainta, R. Ilangoan, O. Faiz, R. H. Kennedy*St Mark's Hospital and Academic Institute, London*

**Aims:** Bowel cancer screening has resulted in increasing numbers of early cancers and endoscopically irresectable colonic polyps that require an alternative to colectomy. Full-thickness laparoendoscopic excision offers a potential solution, but would benefit from accurate preoperative characterisation of target lesions. This study evaluated the accuracy of CT colonography in defining local topography of early colonic neoplasia.

**Methods:** Consecutive patients undergoing preoperative CT colonography examination within 2 months prior to colonic resection for complex benign polyps or UICC stage 1 cancer were analysed by two specialist gastrointestinal radiologists who were blinded to the histopathological findings.

Mesenteric/anti-mesenteric location, proportion of circumference involved and maximum lesion diameter were recorded and correlated with postoperative specimen data. Kappa agreement ( $\hat{\rho}$ ) and Spearman's correlation coefficient (rs) were used for circumferential proportion and maximum lesion diameter, respectively.

**Results:** 36 patients with 36 early colonic neoplasias (12 polyps & 24 UICC stage I cancers) were included. The mean maximum lesion diameter was 39 mm, 25/36 lesions were on the mesenteric border and 20/36 were in the left colon (distal to splenic flexure). From a per-lesion analysis, mesenteric location was correctly identified in all 36 cases (diagnostic accuracy: 100%). The proportion of circumference involved by the lesion was correctly defined in 30/36 cases (rs: 0.845). Good agreement was shown for measurement of maximum lesion diameter ( $\hat{\rho}$ : 0.787).

**Conclusions:** CT colonography can accurately define local characteristics of colon polyps and early cancers. This may assist in stratifying colonic polyps that are suitable for full-thickness laparoendoscopic excision.

## Cancer/Surgical Oncology (GI) 0772

### Pre-operative and post-operative incidence of Deep Vein Thrombosis in colorectal cancer surgery

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**Aims:** Venous thromboembolism (VTE) is a major cause of death in patients undergoing colorectal cancer surgery and usually arise from Deep Vein Thrombosis (DVTs). In patients with cancer below knee and asymptomatic DVTs are at risk of propagating and resulting in a VTE. Retrospective, population based studies predating extended course venous thromboprophylaxis report an incidence of symptomatic VTE in colorectal cancer patients of approximately 5-5%. We undertook a multicentre prospective study to screen colorectal cancer patients pre- and post-operatively for the presence of DVTs.

**Methods:** Patients at four hospitals undergoing elective curative surgery for colorectal cancer were recruited pre-operatively. Exclusion criteria were: previous VTE, previous malignancy, anti-coagulants. Bilateral full leg venous duplex was performed pre-operatively and at six weeks post-surgery. Plasma D-dimer was measured pre-operatively.

**Results:** Of 60 patients undergoing pre-operative duplex, five (8.3%) had below knee, asymptomatic DVTs. These patients were then excluded from further analysis. Of the remaining 55, 48 had post-operative duplex examination. Three (6.3%) developed post-operative DVTs all of which were asymptomatic and below knee. There were no symptomatic DVTs. Two of these patients had received extended course venous thromboprophylaxis and the other received inpatient thromboprophylaxis. Development of a post-operative DVT was associated with lymph node positivity ( $p = 0.02$ ). Pre-operative D-dimer was higher in patients who developed a post-operative DVT compared to those who did not (1275 ng/L (95%CI: 780–1770 ng/L) vs 805 ng/L (95%CI: 632–980 ng/L)  $p = 0.03$ ).

**Conclusions:** Of patients diagnosed with operable colorectal cancer, 8% have pre-operative asymptomatic DVT, and a further 6% develop a DVT despite thromboprophylaxis. The subgroup of patients with lymph node involvement may benefit from more aggressive anticoagulation as they are at increased risk of DVT despite extended course anticoagulation. Pre-operative D-dimer may offer a predictive method to identify patients at risk of post-operative DVT.

## Cancer/Surgical Oncology (GI) 0798

### Tissue factor promotes colorectal cancer cell proliferation

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**Aims:** Tissue factor (TF) is abnormally expressed in many cancers including colorectal and is associated with a poor cancer prognosis. Colorectal cancer cell lines expressing TF produce faster growing tumours. In lung cancer, TF inhibition has been shown to reduce proliferation. We aimed to determine if

TF expression and activity increases cellular proliferation in colorectal cancer cell lines.

**Methods:** DLD-1 and SW620 colorectal cell lines were transduced with cDNA to over express TF (TF + ve). Proliferation was determined by Alamar blue assay where level of absorption indicates the number of living cells, expressed as an arbitrary unit of absorption (u). Factor VIIa (TF ligand) at increasing concentrations was used to determine the effect of TF activity on proliferation. Downstream marker of TF activity (MAPK phosphorylation) was assessed by Western blot and correlated with proliferation.

**Results:** There was a significant increase in proliferation in both DLD-1 TF + ve and SW620 TF + ve compared to their negative controls at 42 hours (DLD1 TF + ve: 5455u (SD 2485u) vs 2246u (SD 1107u) <0.001; SW620 TF + ve: 414u (SD 96u) vs 286u (SD 114u) <0.05). When factor VIIa (FVIIa) was added in concentrations from 0nM to the supra-physiological concentration of 25nM there was a dose-dependent increase in proliferation up to physiological levels (0.1nM) which was further increased in the TF + ve cell lines. Fold change from baseline 0nM vs 0.1nM FVIIa (DLD-1: 3.22u (SD 0.61u) vs 6.17u (SD 2.21u) <0.05; SW620 2.33u (SD 2.21u) vs 4.69u (SD 0.61u) <0.05). The increase in proliferation was reflected in the phosphorylation of MAPK which was increased by TF overexpression alone and further increased by FVIIa in a dose-dependent fashion.

**Conclusions:** Increased TF expression and activation is associated with increased cellular proliferation. This effect appears to be exerted via MAPK pathways. Tissue factor may provide a therapeutic target in colorectal cancer.

## Cancer/Surgical Oncology (GI) 0813

### Expression of the tissue factor thrombin pathway is upregulated in the stroma and epithelium of colorectal cancer

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**Aims:** Colorectal cancer expression of Tissue Factor (TF), PAR1 and PAR2 is associated with a poor prognosis. Their stromal, rather than epithelial, expression has prognostic significance in other cancers, this has not been explored in colorectal cancer. We investigated their expression patterns in colorectal cancer and normal tissue.

**Methods:** Cancer and distant normal tissue were sampled from 37 patients. Expression of TF, Thrombin, PAR1 and PAR2 were determined by immunohistochemistry. Two observers scored expression level (0–3) in individual cells. Percentage of cells having each level of expression was determined and an H-score calculated which is given with 95% CI.

**Results:** Normal epithelium did not express TF, but it was expressed by cancer epithelium (36.5 (95% CI 17.6–55.4) <0.001). Thrombin expression was increased in cancer vs normal epithelium (126.2 (95% CI 110.6–141.7) vs 101.6 (95% CI 92.5–110.8)  $p = 0.01$ ) as was PAR2 (172.4 (95% CI 152.9–191.8) vs 123.4 (95% CI 107.8–139.0) <0.001). The increase in cancer epithelium PAR1 expression compared to normal (105.4 (95%CI 84.3–126.5) vs 89.0 (95% CI 80.4–97.6)) was not significant. Normal stroma did not express TF or thrombin however both were expressed by cancer stroma (TF 46.3 (95% CI 24.6–68.0) <0.001, thrombin 11.4 (95% CI 6.2–16.7) <0.001). PAR1 and PAR2 were both expressed in normal stroma but demonstrated increased expression in cancer stroma (cancer vs normal; PAR 1: 130.7 (95% CI 112.2–149.2) vs 19.5 (95% CI 11.24–27.7) <0.001; PAR2: 21.5 (95% CI 12.9–30.1) vs 2.21 (95% CI 0.49–3.92) <0.001).

**Conclusions:** Upregulated expression of tissue thrombin pathway proteins is seen in colorectal cancer in both epithelial and stromal cells. Procoagulant tumour cells and tumour microenvironment may provide a novel therapeutic target for treatment in colorectal cancer.

## Cancer/Surgical Oncology (GI) 0840

### Effect of Lower Doses of Dichloroacetate in Combination with Radiotherapy on Colorectal Cancer Cell Lines

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**Aims:** Neoadjuvant radiotherapy confers a well-established benefit in locoregional recurrence for patients with locally invasive rectal cancer. However, only around 50% experience significant downstaging of their tumour. Radiation-associated toxicity renders dose escalation unachievable. Dichloroacetate (DCA) is a generic drug shown to modify tumour metabolism reversing the Warburg effect and inducing apoptosis and may potentially enhance the effect of radiation. The aim of this study was to investigate the effects of DCA at lower doses in combination with radiotherapy on the survival of CRC cell lines, and any possible synergistic DNA damage.

**Methods:** CRC cells (LoVo) and control cells (HEK 293) treated with DCA (2,5,10 mM) and irradiation (0,4,8 Gy). Influences of the combination treatment on cell survival were analysed using MTT assays and clonogenic assays and the induction of DNA damage by quantifying gamma-H2AX foci. Statistical analyses were performed using GraphPad, differences between DCA-treated and vehicle control groups were assessed using the Mann-Whitney U test.

**Results:** DCA (5 mM) significantly reduced the survival of CRC cells in combination with 4 Gy and 8 Gy ( $P = 0.0244, 0.0078$ , respectively). DCA (10 mM) significantly reduced survival of CRC cells in combination with 4 Gy and 8 Gy ( $< 0.0001, < 0.0001$ , respectively). DCA dose of 5 mM significantly increased the level of DNA damage per cell induced at both 4 Gy ( $P = 0.0041$ ) and 8 Gy ( $P = 0.023$ ). DCA (2,5,10 mM) significantly reduced the survival of unirradiated CRC cells ( $P = 0.0004, < 0.037, < 0.0001$ , respectively).

**Conclusions:** Lower doses of DCA shown to have an additive killing effect in combination with radiation in CRC cells. A similar picture of sensitivity was seen in normal cells demonstrating DCA not completely harmless. Further research warranted exploring DCA as a potential adjunct in the management of rectal cancers.

## Cancer/Surgical Oncology (GI) 0899

### The Rate of Preoperative Biopsy Confirmation in Tems Resection of Rectal Adenocarcinoma

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**Aims:** To minimise post operative morbidity and mortality associated with formal rectal resection, Transanal Endoscopic Microsurgery (TEM) has become increasingly popular for rectal polyps and early cancers (1). Despite preoperative biopsies demonstrating only benign disease, a proportion of TEMS specimens will contain evidence of invasive adenocarcinoma. We aim, in a single centre cohort, to quantify this and investigate associations between patient and biopsy characteristics and the risk of incidental adenocarcinoma.

**Methods:** Data on all patients undergoing TEMS for rectal lesions between 2010 and 2014 was prospectively collected. Patient characteristics, preoperative biopsy histology and TEMS pathological data were investigated. Pearson's Chi squared analysis was used to test for statistical significance.

**Results:** In total, 101 patients underwent TEMS for primary resection for rectal lesions. Of these, 10 were known to have adenocarcinoma on preoperative

biopsy. Of the 91 resected with no biopsy confirmation of invasive disease, 13 (14%) were found to have evidence of malignancy. Neither gender, age, high risk adenoma features or size of lesion was associated with incidental cancer risk.

**Conclusions:** A significant number of TEMS resected rectal adenocarcinomas in the current study had preoperative benign pathology. This highlights the difficulty gaining representative pathology in rectal lesions suitable for TEMS. (1). Kidane B et al. 2014.

## Cancer/Surgical Oncology (GI) 0902

### Predicting Risk of Impairment of Bowel Related Quality of Life After Sphincter-Preserving Resection For Rectal Cancer: A Multicentre Cross Sectional Study

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**Aims:** A restorative anterior resection is regarded as the optimal procedure for most patients with rectal cancer and is frequently preceded by radiotherapy. Both surgery and pre-operative therapy impair bowel function, which adversely affects quality of life. The purpose of this study was to assess and predict the risks of bowel dysfunction, by identifying risk factors predicting impairment of bowel related quality of life (BQoL).

**Methods:** Patients who had restorative anterior resection between 2001–2012 (median post op of 5.25 years) were invited to complete patient reported outcome measures (PROMs). PROMs assessed quality of life (EORTC QLQ-C30), bowel dysfunction (Low anterior resection score (LARS) and Wexner incontinence forms) plus a BQoL anchor question - 'overall how does bowel function affect your quality of life?' The BQoL response was compared against demographics, tumour characteristics, and treatments using unifactorial and multifactorial ordinal regression analysis.

**Results:** Twelve UK centres identified 578 eligible patients, 462 (80%) responded. Overall 391/462 (85%) reported BQoL impairment, with 187/462 (40%) reporting major BQoL impairment. A large difference in global quality of life (22 points,  $< 0.001$ ) was reported for 'none' versus 'major' BQoL impairment, with greatest symptom severity for diarrhoea (25 points,  $< 0.001$ ), insomnia (24 points,  $< 0.001$ ) and fatigue (20 points,  $< 0.001$ ). Regression analysis predicted major BQoL impairment in 60% of patients with low rectal cancer treated with pre-operative radiotherapy (45% without radiotherapy) and 47% of mid/upper rectal cancers (33% without radiotherapy).

**Conclusions:** Prior to treatment, patients should be aware that BQoL impairment is common, with low tumours and neoadjuvant therapy adverse risk factors. There are mechanisms for improving post-treatment symptoms, though of limited efficacy. To minimize morbidity, selective use of radiotherapy is recommended.

## Basic Science

### Cancer/Surgical Oncology (GI) 0113

#### Identification of Altered Keratin in Cancerized Colonic Fields using Isobaric Tags for Relative and Absolute Quantification (iTRAQ) for protein profiling

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**Aims:** A cancerized field is an area of abnormal tissue in the vicinity of a cancer but appearing to be macroscopically normal. Identification of these has important clinical implications as abnormal tissues could be left in situ following polypectomy or surgical resection, leading to neoplastic recurrence.

**Methods:** Colonic biopsy tissue was obtained from 8 patients with adenomas. Biopsies were taken from: the adenoma (AD), the bowel wall opposite the adenoma (CO) and a standardised distance away from the adenoma (MS). Biopsies were also taken from 8 patients without colonic pathology (N). Intermediate filaments from the biopsies were extracted and solubilised. The samples were pooled according to site and exposure to high (H) or low (L) butyrate within the colon. The samples were trypsin digested and iTRAQ labelled before fractionation followed by reverse phase high performance liquid chromatography on line to a tandem mass spectrometer. The mass-spectrometric data was matched against the UniProt protein knowledgebase to derive peptide sequence and protein identification. Fold change comparisons were made using SignifiQuant software set at significance level < 0.01. iTRAQ results were validated using Western immunoblot analysis and densitometry.

**Results:** Keratin 8 (K8) was significantly increased in pathological tissue (AD, CO and MS) in both high and low butyrate groups when compared to normal tissue, suggesting a cancerized field.

**Conclusions:** Samples from high butyrate environments exhibited increased K8 levels compared to low butyrate equivalents. Previous studies have demonstrated colonic hyperplasia and inflammation in K8 knockout mice. It is possible that increased K8 represents an effort to stabilise the colonic mucosa before transformation to cancer. These observations imply the mechanism by which butyrate protects against colonic cancer is through upregulation or altered solubility of K8. Precancerous mucosa can be distinguished from normal mucosa; evidenced by the lower molecular weight forms of K8 immunoreactive proteins identified in the adenoma samples.

### Cancer/Surgical Oncology (GI) 0279

#### The Prognostic Significance of CCR7-Positive Cells and Relationship with Body Composition in Colorectal Cancer

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**Aims:** The host local immune response (LIR) to cancer is a determinant of cancer outcome. Regulation of this local response is largely achieved through chemokine synthesis from the tumour microenvironment such as C-Chemokine Receptor 7 (CCR7). We examined the LIR measured as CCR7 expression, in colorectal cancers (CRC) and explored relationships with both clinicopathological characteristics, including body composition (BC) and survival.

**Methods:** A study of paraffin-embedded tissue specimens was carried out in 116 patients with non-metastatic CRC treated surgically. CCR7 expression was determined by immunohistochemistry. The density of CCR7 positive (+) cells was calculated using image analysis software, and analysis of computer tomography scans was used to calculate BC parameters. Survival analyses were performed using the Kaplan-Meier method and multivariate Cox regression models.

**Results:** High CCR7+ cell density within the tumour stroma and at the periphery of tumours was significantly associated with several adverse prognostic

factors, including increased age, the presence of lymphovascular invasion, higher tumour stage, lymph node metastasis and myosteatosis. High CCR7+ cell density in the tumour periphery was significantly associated with shorter disease-free (DFS) and overall survival (OS) (< 0.001). This was also significantly associated with shorter survival in multivariate regression analysis (HR = 8.87; 95%CI (2.51–31.3); p = < 0.01 for OS and HR = 4.72; 95%CI (1.24–12.9); p = 0.02 for DFS).

**Conclusions:** A high density of infiltrating CCR7+ cells was associated with aggressive behavior of CRC. Our results suggest that a specific immune microenvironment may be associated with altered host's body composition and tumour behavior and that CCR7 may serve as a novel prognostic biomarker.

### Basic and Applied Clinical Science 0371

#### Copper Absorption in Chronic Pancreatitis

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**Aims:** The purpose of the study was to determine the influence of exocrine pancreatic insufficiency (EPI) on copper absorption in man.

**Methods:** 64 Cu absorption was measured by a computerised deconvolution program after separating 64 Cu in serial blood samples from that bound to caeruloplasmin by elution through charcoal columns. The method was previously designed, validated, and tested for reproducibility using healthy volunteers.

**Results:** Excluding three on oral contraceptives (OC+), 10h- 64 Cu absorption in healthy volunteers was 42.3 (±9.7)% (n = 9) [or 1.84 ± 0.43%/BMI]; 6 male, 3 female) on their habitual diet. In nine patients with CP, 10-h absorption was 35.9 (±12.8)% [1.71 ± 0.52]; 6 male and three female. Clinical pancreatic insufficiency (CPI) patients had pancreatic steatorrhoea. Lower absorption 26.9 (±7.5)% (n = 5) [1.33 (±0.33)] associated more with CPI (t = 4.078, P2 < 0.01) than with vagal transection (VT+) (n = 3) (t = 3.588, P2 < 0.01). Non-CPI patients absorbed 47.2 (±7.3)% (n = 4) [2.17 ± 0.18]. Without patients with achlorhydria (DM, DH), the CPI group 10h absorption was still low at 32.1 (±3.1)% (n = 3) [1.57 (±0.11)]. In the CPI group, the three patients (DH, DM, and NK) had been on long-term supplements (LT+). VT+ (DH, DM, BJ) had lowest absorption; two (DH, DM) with achlorhydria absorbed least. When Nutrizym was combined with oral 64 Cu dose in two, DM (total pancreaticoduodenectomy patient) increased his per cent absorption from 18.2 to 40.9%, whereas a non-CPI patient absorption remained unaltered (42.8 to 40.8%). There was a greater decrease in 64 Cu absorption in CP with a casein meal, using a closely matched control of 2 subjects.

**Conclusions:** Unlike the casein meal 64 Cu absorption from 350 ml water reflected inversely only copper status. There was no evidence of direct inhibition of copper absorption by normal pancreatic secretion in man, but severe EPI appeared to result in decreased 64 Cu absorption.

### Cancer/Surgical Oncology (GI) 0767

#### Tissue Factor Expression In Colorectal Cancer Cell Lines Inhibits Cancer Stem Cell Activity

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**Aims:** Abnormal Tissue Factor (TF) expression occurs in many cancers including colorectal and is associated with a poor prognosis. TF expression promotes cancer stem cell (CSC) activity in breast and squamous cell carcinoma (SCC). We aimed to determine the effect of TF expression on colorectal CSC activity.

**Methods:** Colorectal cancer cell lines with high (DLD-1) and low (SW620) TF expression were stably transduced to knock down (TF-ve) and over express

(TF +ve) TF. CSC activity was assessed using the cancer sphere assay (sphere forming efficiency (SFE) = spheres formed / cells plated) and ALDH1 expression (by fluorescent activated cell sorting). When comparing transduced cells to their control the ALDH1 expression was normalised to their control.

**Results:** The naturally high TF expressing cell line (DLD-1) compared to the low TF expressing cell line (SW620) had a reduced SFE (0.7 (SD 0.39) vs 1.38 (SD 0.68),  $p < 0.05$ ) and less cells expressed ALDH1 (15.3% (SD 1.2) vs 26.9% (SD 2.1),  $p = 0.02$ ).

DLD-1 TF +ve compared to its control had a reduced SFE (0.33 (SD 0.14) vs 0.66 (SD 0.42),  $p < 0.01$ ) and less cells expressed ALDH1 (0.72 (SD 0.069)  $p = 0.001$ ) (normalised to negative control). There was no difference in SFE (1.21 (SD 0.56) vs 1.29 (SD 0.50)  $p = 0.4$ ) and ALDH1 expression (0.81 (SD 1.00)  $p = 0.5$ ) between SW620 TF +ve and its control.

DLD-1 TF-ve and SW620 TF-ve had increased SFE compared to their controls (DLD-1 TF-ve: 0.63 (SD 0.27) vs 0.41 (SD 0.35)  $p < 0.01$ ; SW620 TF-ve: 2.03 (SD 0.86) vs 1.21 (SD 0.70)  $p < 0.01$ ), and increased ALDH1 expression (DLD-1 TF-ve: 1.23 (SD 0.74)  $p = 0.04$  and SW620 TF-ve: 1.31 (SD 0.08)  $p < 0.001$  normalised to controls).

**Conclusions:** In colorectal cancer cell lines, unlike breast and SCC, TF inhibits CSC activity. A possible explanation for this is the known increased activation of MAPK that occurs in the presence of high TF expression which increases differentiation.

## Cancer/Surgical Oncology (GI) 0799

### Endotoxin (Lps) - Induced Tolerisation of Colorectal Cancer Cells Increases Their Metastatic Potential in Vitro And in Vivo

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**Aims:** Endotoxin tolerance (ET) is a refractory state in which, immune cells show unresponsiveness to repeated LPS stimulation. Inflammation increases the incidence of tumour recurrence and metastases despite curative surgery in colorectal cancer. Toll-like receptor 4 (TLR4), which binds LPS, has a cardinal role in orchestrating the inflammatory cascade and mediating ET. It is well known that LPS also stimulates tumour cells, although the TLR4-mediated ET role in metastatic cascade is poorly understood. Therefore, we investigated whether LPS pre-treatment influences human or murine colorectal cancer cells adhesion, proliferation and invasion in vitro and in vivo.

**Methods:** Human (SW620, SW480) and murine (CT-26) colorectal cancer cells were pre-stimulated with LPS (100 ng/ml) to induce tolerisation. Non-tolerised and tolerised cells were then assessed for cytokine profile, adhesion to extracellular matrix components, invasion and viability. For in vivo experiments, CT-26 cells were either inoculated into the flank of BALB/c mice ( $n = 24$ ) to assess primary tumour growth or ( $n = 24$ ) underwent intra-splenic injection of CT-26 cells to observe metastatic growth in the liver.

**Results:** Following LPS treatment SW620 cells demonstrated reduced ( $p = 0.002$ ) interleukin-8 and vascular endothelial growth factor release, confirming that LPS pre-stimulation induced tolerisation in these cells. Furthermore, LPS pre-treatment of SW480, SW620 and CT-26 cells resulted in increased ( $p = 0.046$ ) proliferation, adhesion and invasion in vitro. Similarly, LPS pre-stimulation of CT-26 cells in BALB/c mice exhibited marked primary and metastatic tumour growth ( $p < 0.05$ ). Statistical significance was evaluated by Student's t-test and analysis of variance (ANOVA). A  $p$ -value  $< 0.05$  was considered statistically significant.

**Conclusions:** These results suggest that surgery or sepsis induced Gram-negative bacteraemia can lead to an endotoxin tolerant state in tumour cells, which activates the metastatic cascade. This observation may elicit a better understanding of colorectal cancer cell growth, either locally or systemically in the perioperative period.

## Basic and Applied Clinical Science 0818

### Diminished MAPK Signaling in M1 Polarised Macrophages Exposed to Bacterial Stimulation

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**Aims:** Macrophages are divided into subpopulations based on their functional phenotypes. Classically activated (M1) macrophages are induced by IFN- $\gamma$  and LPS, while alternatively activated (M2) macrophages are induced by IL-4 or IL-13. We established M1 and M2 macrophage polarisation profiles in vitro. We then stimulated these cells with gram positive and gram negative bacteria. Following this we examined the MAPK and NF- $\kappa$ B signalling pathways.

**Methods:** Peritoneal and bone marrow derived macrophages were harvested from C57BL/6 mice. Cells were exposed to polarizing stimuli for 18–24 hours. (M1 - LPS and IFN- $\gamma$ , M2 - IL-4). Polarised cells were further stimulated with heat-killed *Staphylococcus aureus* and *Salmonella typhi*. Inflammatory cytokine production was assessed by FACS analysis. Western blot analysis was carried out for the p38 MAPK and NF- $\kappa$ B signaling pathways.

**Results:** At baseline M1 polarised macrophages were characterised by high levels of pro-inflammatory cytokines, whereas when cells were exposed to bacteria, M1 polarised macrophages were found to have lower levels of pro-inflammatory cytokines when compared with naïve and M2 polarised macrophages. We found lower levels of p38 and NF- $\kappa$ B signaling in M1 polarised macrophages stimulated with both gram-positive and gram-negative bacteria when compared with naïve and M2 polarised macrophages.

**Conclusions:** M1 macrophages are expected to produce higher levels of pro-inflammatory cytokines than naïve or M2 macrophages, however we have found an endotoxin like phenomenon when M1 macrophages are exposed to bacterial stimulation. We found that p38, part of the MAPK signaling pathway, and NF- $\kappa$ B signaling may play a role in these unexpected findings.

## Cancer/Surgical Oncology (GI) 0829

### Exploring the Tumour Stroma Macrophages to Identify Responders to Radiotherapy in Locally Invasive Rectal Cancer

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**Aims:** Only half the patients with locally-invasive-rectal-carcinoma (LIRC) respond to short-course-preoperative-neoadjuvant radiotherapy (SCPRT). A predictive test enabling better patient selection could avoid undue radiation exposure to poor-responders. Macrophages within the tumour immune microenvironment with tumouricidal M1 and tumour-protective M2 phenotypes could be modulating this response. This study investigates the possible predictive value of M1 and M2 in identifying patients' likely response to SCPRT.

**Methods:** Dual-staining immunohistochemistry was performed on 29 biopsy and post-SCPRT resection LIRC specimens with CD68 as macrophage marker, Human-Leukocyte-Antigen-DR (HLA-DR) as M1-marker and Cluster-of-Differentiation-163 (CD163) as M2-marker. Specimens were scored for hot-and-random spots by Nuance-3.0.2 and compared with patients' outcome data.

**Results:** A significant difference was found for high and low M1 percentages with a tumour response of 20% and 80%, respectively ( $p = 0.017$ ). No such difference was found for M2. The ratio of M1/M2 in biopsy vs. resection samples was found to be significantly different ( $< 0.05$ ), and change in ratio producing a significant mean ( $p = 0.024$ ).

**Conclusions:** Patients with a variable macrophage phenotype composition within LIRC biopsies respond differently to SCPRT. Further investigation involving a panel of macrophage/other immune-cell markers could verify and validate these findings and develop them as predictive tests identifying good-responders to radiotherapy in patients with LIRC.

## Cancer/Surgical Oncology (GI) 0846

**Morphine Potentiates the Action Of 5-Fluorouracil and Cisplatin, Possibly Through Inhibition of Autophagy**D. Brinkman<sup>1</sup>\*, T. O'Donovan<sup>2</sup>, S. McKenna<sup>2</sup>, J. H. Wang<sup>1</sup>, H. P. Redmond<sup>1</sup><sup>1</sup>Cork University Hospital, <sup>2</sup>Cork Cancer Research Centre

**Aims:** Morphine is used regularly in clinical practice for pain management. Its action on the growth of various cancers has been researched with varying results. 5-fluorouracil (5-FU) and cisplatin are commonly used in chemotherapeutic regimens for colon cancer, and can quite often be given with morphine. Autophagy is a cell survival mechanism that can occur when stress is applied. By digesting non-essential organelles in autophagosomes, the cell can continue to fuel essential processes. We wished to investigate the effect of the combination of the two drugs on tumour growth and determine whether this effect was due to a change in autophagic flux.

**Methods:** Human colon cancer cell lines (SW480 & SW620, primary and metastatic respectively) were treated with varying doses of 5-FU, cisplatin and morphine alone and a combination for various time points in vitro. Various parameters were assessed: morphology by cytospin, proliferation by viable cell staining, apoptosis by propidium iodide staining, autophagosome levels by 'Cyto-ID' assay and recovery from treatment by a modified colonogenic assay. Paired samples t-tests were used to determine statistical significance. P-values < 0.05 were considered significant.

**Results:** Morphine alone had little effect compared to control. Chemotherapeutics alone predictably decreased proliferation, increased apoptosis and autophagic flux and significantly reduced the colony count. Chemotherapeutics and morphine in combination had a significantly increased effect in suppressing tumour colony growth/recovery (p < 0.05). Together, they suppressed autophagosome levels but decreased apoptosis in both cell lines.

**Conclusions:** Morphine in combination with 5FU and cisplatin potentiates the effect of these chemotherapeutic agents. Further study is required to confirm the effect is due to the suppressed survival mechanism, autophagy.

## Basic and Applied Clinical Science 0920

**Expression Of Fibulin-5 is Decreased in Male Patients with Rectal Prolapse**H. Joshi<sup>1</sup>\*, M. P. Gosselink<sup>1</sup>, Edward A Smyth<sup>1</sup>, J. Urban<sup>2</sup>, O. Jones<sup>1</sup><sup>1</sup>Oxford University Hospitals Trust, <sup>2</sup>University of Oxford

**Aims:** To compare Fibulin-5 (FIB-5) expression in the skin of patients with rectal prolapse with that of patients without rectal prolapse.

Rectal prolapse is a prevalent disorder affecting up to 10% of patients in the United Kingdom. Components of the connective tissue other than collagen have been found to be involved in development of prolapse. Elastic fibre organization differs between controls and subsets of patients with rectal prolapse. Transgenic mice have demonstrated the importance of elastic fibres for maintaining structural and functional integrity of the pelvic floor. Elastic fibres assembly is a complex process and fibulin-5 integral in this process. Mice with null mutation in fibulin-5 (Fbln5 <sup>-/-</sup>) develop prolapse.

**Methods:** Between January 2013 and February 2014, skin specimens were obtained prospectively during surgery from 20 patients with rectal prolapse and from 21 patients without prolapse undergoing surgery for other indications. Fibroblasts from the skin were cultured and levels of Fibulin -5 expression was determined on cultured fibroblasts, isolated from these specimens by Quantitative Real-Time PCR. Immunohistochemistry was performed on fixed tissue specimens to assess FIB-5 expression.

**Results:** FIB-5 mRNA expression and FIB-5 staining intensity was significantly lower in the young male patients with rectal prolapse when compared to age matched control groups. (FIB-5 mean +/- SD mRNA relative units) 1.1 +/- 0.41 vs. 0.53 +/- 0.22, p = 0.001] and Intensity score, median (range), 2(0-3) vs. 1(0-3), p = 0.05]. There was no significant differences in expression of FIB-5 in women with rectal prolapse compared with control.

**Conclusions:** FIB-5 maybe implicated in the aetiology of rectal prolapse in a subgroup of young male patients.

## Basic and Applied Clinical Science 1025

**Aspirin Enhances The Response to Radiation in Colorectal Cancer Cells**K. Gash<sup>\*</sup>, A. Chambers, T. Collard, A. C. Williams, M. Thomas

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**Aims:** Failure of rectal cancer to respond to neo-adjuvant therapy continues to be a significant problem affecting around 40% of patients. Colorectal cancer stem cells [CSC], are thought to be responsible for fuelling resistance and driving recurrence. The COX2 / PGE2 and BCL-3 / NF- $\kappa$ B signalling pathways have been shown to drive the survival of the CSC population and hence potentially confer resistance to therapies. Our group has previously shown that Aspirin represses both PGE2 production and inhibits BCL-3 expression in colorectal cancer cells. We aimed to ascertain whether Aspirin has a role as an adjuvant treatment in colorectal cancer, to increase the response to radiotherapy, through directly targeting the CSC activity.

**Methods:** Colorectal carcinoma (CRC) and adenoma cell lines (HCA7/P, LS174T, LoVo, AN/C1 and RG/C2) were seeded and grown prior to treatment with Aspirin, (1-2 mM for 24-96 hours): cell yield and apoptosis were recorded and protein analysis performed by Western blotting.

A model for radiotherapy was established and validated, using a Caesium irradiator. Plates were seeded at specific densities of CRC cells and treated with varying doses of Aspirin and/or radiation, compared to control. Crystal violet cell viability assay was performed. All experiments performed in triplicate; mean values reported.

**Results:** Aspirin (2 mM) decreased cell yield and apoptosis in carcinoma and adenoma cell lines, compared to the control.

Western analysis showed reduced expression of the CSC marker LGR5 in RG/C2 adenoma cells, after treatment with Aspirin (1-2 mM).

The combined treatment of 2 mM Aspirin and 2.5Gy radiation resulted in a two-fold decrease in cell viability, compared with 2.5Gy radiation alone: HCA7 (1x10<sup>4</sup> cells) 0.25 vs. 0.48 and LS174T(0.5x10<sup>4</sup> cells) 0.147 vs. 0.364.

**Conclusions:** Through targeting the colorectal CSC phenotype, Aspirin enhances the effect of radiation, as demonstrated in-vitro. Clinical translation of these findings is currently being evaluated in our prospective cohort study, (ASPIRE).

## General Surgery Surgical pathways

### Audit and Outcomes Research 0448

#### Impact of Hot Clinic on Acute General Surgical Admissions

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**Aims:** To improve early assessment of patients with acute abdominal pain referred from general practitioners (GP) and the Emergency Department (ED). A consultant Surgeon was scheduled to run a 'Hot Clinic' (HC) in the acute surgical observations unit (SOU) adjacent to the ED on weekday afternoons.

**Methods:** All patients with acute abdominal pain referred for a surgical opinion between 2nd June and 29th June 2014 (Cohort 1, pre-HC), and 28th July and 24th August 2014 (Cohort 2, post-HC) were identified through daily surgical handover, admission and discharge lists. Data were collected from electronic patient records. Patients transferred from other Hospitals, ward referrals, obstetric and trauma patients were all excluded. Data recorded included length of stay (LOS) in hospital (all GP referrals were 'admitted' while being assessed), LOS in ED and re-referrals within a 3 month period. Pearson Chi Squared and Mann Whitney U statistical tests were used.

**Results:** A total of 829 patients with acute abdominal pain were referred during the study period, of which 613 met the inclusion criteria; 299 in cohort 1 and 314 in cohort 2. There was no difference in demographics between the groups. Similarly there was no difference in LOS in ED and the proportion of patients re-presenting. However the median length of stay in hospital was significantly shorter in Cohort 2 (Cohort 1, 64.9 hours, IQR: 31.6–113.0 hours versus Cohort 2, 50.6 hours, IQR: 24.6–102.6 hours;  $P = 0.022$ ). This transpires to a 22% reduction in bed occupancy. This study was limited by the fact that the electronic patient recording system 'admits' all patients referred to SOU, so the actual benefits of the HC are likely to be underestimated. Further data collection is ongoing.

**Conclusions:** The introduction of the surgical Hot Clinic is associated with a significant reduction in hospital stay for patients referred with acute abdominal pain.

### Audit and Outcomes Research 0637

#### Morning Rounds: a Prospective Study to Analyse Quality and Efficacy of the Surgical Ward Round

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**Aims:** Although the ward round is the first and focal part of the surgical day, there are few studies that assess the quality of a surgical ward round and search for potential deficiencies. Recent evidence has suggested that high quality rounds improve patient care and safety. This study aimed to assess the surgical ward round in our unit, highlight good and bad practice and make recommendations for improvement.

**Methods:** This was a prospective, single-blinded study. Ward rounds were recorded by an independent observer. The surgeon leading the round and the doctor documenting it were blinded to the audit proforma. The following domains were assessed for discussion on the round and documentation in the notes: appropriate introduction, privacy, history, examination, review of bloods, imaging and observations, nutrition, rationalisation of medications, thrombo-prophylaxis, fluid management and antibiotic discussion. Chi-squared tests were used to compare consultant and junior rounds.

**Results:** Ward round analysis was available for 37 patients, over a period of 5 days. The mean length of time per patient was 5.4 minutes (range, 5–14). Discussion ranged between 22% of patients (thrombo-prophylaxis) to 97% (privacy). Documentation was considerably worse, ranging from 3% (consideration of privacy) to 54% (documentation of observations). Just 25% of nutrition plans

or reviews of relevant results were documented on a consultant round as compared with 76% on registrar rounds ( $P = 0.032$ ).

**Conclusions:** Performance and documentation of rounds varied. Commonly missed areas, in terms of consideration on a ward round, included thrombo-prophylaxis and rationalisation of medications. A focus on ward round quality and guidance on commonly missed areas may improve performance and, as a result, patient care.

### Audit and Outcomes Research 0641

#### Audit Completion in General Surgery

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**Aims:** A clinical audit can promote and enable best practice, identify areas for development and lead to improvements in patient care. A complete audit cycle requires measurement against set standards, reporting of results, implementation of change and re-audit (HQUIP audit definition). Despite being a key requirement of training and revalidation, the overall rate of audit completion is unknown. This multi-centre audit sought to examine audit activity and establish audit completion rates, and reasons underpinning failure to complete.

**Methods:** A standard audit proforma and methodology was established and the project formally registered across three hospitals. Demographic data on each hospital was collated. Audit records were searched to identify audits registered between 1/4/2011 and 31/3/2012. Audit department data was reviewed to establish validity of audit, and progress of audit. Attempts were made to contact each audit team to establish true progress and reasons for failure of completion.

**Results:** 39 Audits were registered within the General Surgery Directorates. Where total trust audit numbers were available this represented 4% (11 of 282) and 13% (17 of 131) of all audits for the year studied. 12 of 24 audit protocols available for review met the HQUIP audit definition. 2 audits were rejected outright as research. 8 never commenced data collection. 6 collected data, but did not submit recommendations. 23 made recommendations, with 7 completed to re-audit. Overall completion rate was 18% (7 of 39). The commonest reasons given for failure to complete audit were gaining a required presentation/publication (no on-going desire) and results felt not to be of value to further investigate.

**Conclusions:** Audit completion rates are low. Our data suggests that audits are often performed to meet training/career progression needs rather than directly to improve patient care. To maximise the efficacy of clinical audit in surgery structured methods are needed to improve completion rates.

### Audit and Outcomes Research 0654

#### Readmission After General Surgery (RAGeS)

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**Aims:** Readmissions are undesirable for patients and carry financial penalties for hospitals where readmissions take place within 30 days. It is in the interest of the Trust and patients to identify who is at risk for readmission and to ensure adequate services are in place.

Our aim was to identify rates of readmission following general surgical procedures by all NHS providers within a region.

**Methods:** A prospective region-wide audit was undertaken over a 2 week period. This included all patients undergoing NHS financed general surgery in the region (excluding vascular and breast surgery), including those at private providers. All patients were followed up for 30 days to identify readmissions. Demographics including index of multiple deprivation (IMD) procedure data

including BUPA and CEPOD classifications and basic post-operative data were collected.

**Results:** One teaching hospital, 3 private providers and 4 district general hospitals participated. There were 698 procedures performed in this period, and 38 readmissions within 30 days (5.44%). Individual unit readmission rates ranged from 0.02–11.7%. When preventable readmissions were removed, the overall readmission rate dropped to 3.29% (range 0.02–6.48%). One unit showed a high-outlying rate of readmission which resolved after exclusion of preventable readmissions. There was no correlation between age, gender or comorbidities and readmission. The least deprived quintile had a lower rate of readmission ( $p=0.02$ ). Comparison between planned and unplanned surgery did not show any difference in readmissions, but sub-group analysis showed the 'expedited' group was more likely to be readmitted (14.8% readmission rate). Readmission rates increased with complexity of surgery (3.45% for minor surgery vs 11.1% for complex procedures,  $p=0.05$ ).

**Conclusions:** In our region, unavoidable readmissions follow 3.3% of operations. Readmission is associated with complexity of surgery and IMD. There is notable unit level variation and this may reflect how re-attenders are managed.

## Audit and Outcomes Research 0672

### Surgical Admission Documentation - An Audit and Re-audit

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Royal Surrey County Hospital

**Aims:** Accurate and complete documentation on admission is vital for communicating clinical information and medico-legally. The primary aim was to compare surgical admission documentation in our trust against standards published by the Royal College of Physicians. The secondary aim was compare this to the medical admission documentation which is done on an existing proforma. The overall objective was to establish if a proforma could improve our surgical admission documentation.

**Methods:** The standards used were from the Hospital Admission Audit Tool produced by the Royal College of Physicians. Data was collected for 25 surgical clerking and for 25 medical clerking on non-consecutive days over a 2 month period. Following a presentation of the results at a weekly surgical meeting, and the production of the Surgical Clerking Proforma, 50 surgical clerking were re-audited against the same standards.

**Results:** In our initial audit, documentation by the medical team using a proforma was significantly better than surgical documentation when no proforma was used. Documentation in many fields such as the responsible consultant, dates and times of senior reviews, examinations performed and investigations requested/performed were closer to 100% in medical clerking than in surgery clerking. Following the development and implementation of the Surgical Clerking Proforma, the re-audit results demonstrated a significant improvement across all documentation fields. Spearman's rank on audit data generated a correlation coefficient of 0.65 and in the re-audit data, a coefficient of 0.78 suggesting that there was a positive correlation between proforma usage and better documentation.

**Conclusions:** Our results have quantitatively demonstrated an improvement in the quality of admission documentation following the introduction of the surgical clerking proforma. Standardising admission clerking can improve documentation and communication of clinical information.

## Audit and Outcomes Research 0676

### Are we Meeting NHS 7-Day Standards Regarding Diagnostic Radiological Services for Emergency General Surgical Patients?

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Department of General Surgery, Good Hope Hospital, Heart of England NHS Foundation Trust

**Aims:** Royal College of Radiologists (Standards for providing a 24-hour diagnostic radiology service) state: "Clinical radiology is now so central to the management of so many patients that its delivery can no longer be confined to

& 'office hours'. Following publication of "NHS Services, Seven Days a Week Forum Clinical Standards" for diagnostic radiological services, the audit aim was to evaluate if we are able to meet NHS 7-day standards for diagnostic radiological services for emergency general surgical patients in our DGH.

**Methods:** A prospective audit was performed between 1/12/14 & 31/12/14 using a proforma to collect data for all emergency general surgical patients who required diagnostic imaging. Data was collected on: type of test, categorisation into critical, urgent, non-urgent (based on clinical presentation/ bloods and MEWS score), time booked and reported for each diagnostic test.

**Results:** 114 patients had diagnostic imaging during this period. Median age 58.8 (range 17–92); 31 male: 83 female. Diagnostic tests performed included: Ultrasound (USS) 56 (49.1%), CT 51 (44.8%), CT-KUB 4 (3.5%), MRI/MRCP 3 (2.6%). Overall median time between booking and reporting tests was 11 hours 41 minutes. Overall, 70/114 (61.4%) tests arranged met the recommended standards. For critical patients, 100% met standard (1/1) (within 1 hour); for urgent patients (50/94) 53% met standard (within 12 hours) and for non-urgent patients 100% (19/19) met standard (within 24 hours). 12 out of 19 (63%) tests arranged in weekends/ bank holiday did not meet recommended standards; USS (5), CT (6), MRI (1). For the individual tests arranged, standards were not met for USS (22/56), CT (19/51) CT KUB (2/4) and MRI/MRCP (1/3).

**Conclusions:** This audit demonstrated that 1 out of 3 of the recommended standards was not met. The results of this audit will be disseminated to radiology staff and a re-audit performed following implementation of changes.

## Audit and Outcomes Research 0692

### The Price of Delivering Quality Healthcare - a Multicentre Assessment of Cost Awareness Amongst Healthcare Professionals and Patients

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**Aims:** Delivering cost effective, high quality healthcare within the constraints of public funding is the goal of the NHS. We surveyed over 250 healthcare professionals and patients to ascertain their cost awareness across 5 different hospitals. Our hypothesis was that cost awareness would increase with seniority and involvement in service development. To our knowledge this is the first study of its kind to include a variety of healthcare professionals and patients.

**Methods:** We developed a survey sampling 14 price points. These included the cost of consumables, services, salaries and procedures. Beyond this, we asked about waste of resources, where this waste was, and if knowledge of healthcare cost would change practice. Doctors, nurses, managers, patients, students and allied healthcare professionals of all grades across 5 hospitals were randomly surveyed over a period of 6 months. Data were anonymised only revealing profession and grade.

**Results:** We gathered over 250 responses and showed no statistical difference in cost awareness between the groups. Costs were generally over-estimated, the only exception being the wage bill. 70% of respondents felt they were wasteful in healthcare and 91% stated they would change their practice if they were more aware of cost. Perception of waste was highly job and grade specific.

**Conclusions:** Cost awareness amongst healthcare professionals is poor. We typically over-estimate cost. In our study there was no difference of cost awareness between different healthcare specialties and grades within those. Furthermore, patients awareness of cost was on a par with professionals. 70% of professionals believed we were wasteful and 91% said they would change their practice if they knew the cost of healthcare.

## Audit and Outcomes Research 0777

### Auditing the Auditors: a Survey of Medical Juniors on Their Experience Of Audit

K. Bowling\*, E. Massri, J. Rait, S. Jarvis, A. Balcombe

South Devon Healthcare Trust

**Aims:** To survey junior doctors experience of audit including cycles performed and loops completed

**Methods:** An online survey tool was used to send an email survey including 14 multiple choice questions from freeonlinesurveys.com. This was sent to all Doctors in an NHS trust.

**Results:** Table 1 demonstrates the questions asked, 116 replies were received. For each response all questions were answered. Doctors on average had 4.48 years (median 4, range 0.58 to 15) of postgraduate experience on completing the questionnaire. Performing an average of 5.97 audits each (median 5, range 0.3–6.86). This equated to 1.72 audits / year (median 1.5, range 0.3–6.86). Of these on average 2.46 audits had their first data collection exercise completed (median 1, range 0–18), this equates to 45.56% (288 audits) of all audits being performed and started having their initial data collection completed. Further to this only 2.02 (median 1, range 0–10) audits on average had a cycle repeated or 33.7% of all audits performed by these doctors.

**Conclusions:** We found that the majority of doctors started more than the required amount of one audit per year as recommended by the modernising medical careers website. However of these less than 50% are completed by the doctors starting them.

Only 47% of all audits performed had Consultant involvement. With over 80% of Doctors feeling that having a locally appointed database controlled and ran by a medical colleague would be more efficient. Clearly from this analysis there is marked room for improvement in the selection, implementation and more importantly the sharing of audit data. Junior Doctors in our experience are often limited by 4 month rotations, balancing the pressures of clinical workload and training. As such it is important that senior colleagues and trainers are heavily involved in their teams respective audits.

## Audit and Outcomes Research 0814

### Quality Improvement Project on the Acute Surgical House-Officer's Bleep

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King's College Hospital

**Aims:** Whilst being an essential method of communication between health-care staff the 'bleep' can lead to interruptions and delay in patient care. A quality-improvement project was carried to monitor the appropriateness of bleeps and to investigate any solutions in reducing the number.

**Methods:** For a 'control' week all the bleeps to the acute surgical house-officer were recorded from 8 am–5 pm. The time of the call, time between the bleep and a phone was found and the call length were recorded. Also recorded was the person bleeping, the purpose of the call and the appropriateness of the bleep.

**Results:** Out of the 89 inappropriate bleeps 35% were either for the wrong team or number, 13.5% were engaged and 11.5% were duplicate bleeps. As a result of the 'control' week, implementations were made including: wi-fi phones for the doctors, discussions with nursing staff and posters were placed on the wards reminding staff on the appropriateness of bleeps. All bleeps were reaudited over 2 day period.

Following the implementations, the average daily number of bleeps drastically fell by 47.8% (22 bleeps c.f. 41.17) and only 8.4% of bleeps were deemed to be inappropriate in comparison to 36% prior. As a result of the wi-fi phones: the average time between the bleep and a phone found was reduced by 53.9% (1.48 minutes c.f. 58.2 seconds) and the average call length was reduced by 23.2%. This led to a cumulative reduction on the house-officer's time spent answering bleeps from 152.05 minutes to 53.36 minutes daily.

**Conclusions:** We have found that the bleep system can cause disruption to patient care. However, our recommendations led to less interruptions from the bleep on ward-rounds. Doctors were able to review patients more efficiently and communication within the team improved, ultimately, leading to enhanced patient-care.

## Emergency Surgery including Trauma (ASGBI) 0861

### Implementation of A Novel Surgical Admission Proforma in a Sub-Specialised Emergency General Surgical Unit to Improve Provision of Care

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Aintree University Hospital

**Aims:** The Emergency General Surgery Unit (EGSU) is a busy subspecialised unit. The high volume of patients admitted to the unit is reflected in recent evidence showing significant increases of emergency surgery nationwide [1]. The NHS commissioning board produced 'Commissioning for Quality and Innovation (CQUIN): guidance', to improve quality, safety and outcomes [2]. These include; dementia assessments and venous thromboembolism (VTE) assessment. This project audits the completion of CQUIN targets, and implementation of a novel surgical admission proforma.

**Methods:** Patients admitted to the EGSU were audited over two 3-week periods pre and post-introduction of the proforma. Items audited included: VTE assessment and prescription, regular medication prescribed and dementia assessment.

Qualitative feedback was obtained from online surveys in order to further develop and improve the proforma.

**Results:** A total of 232 consecutive patients were included in this study, 102 pre-introduction of the surgical admission proforma, 130 post-introduction of which 88 (68%) the surgical admission proforma was used.

VTE assessment completion significantly increased post-introduction of the proforma (pre 62.1% vs post 81.8%, \*\*\*p > 0.001). This was reflected in VTE prescription (pre 64.1% vs 81.8%, \*\*\*p > 0.001). Where the proforma was used, 98% of VTE assessments were completed. Dementia assessment significantly increased post-introduction (9.1% vs 56% respectively, \*\* < 0.01). Introduction of the proforma did not increase prescription of regular medication.

**Conclusions:** Implementation of a novel surgical admission proforma has significantly improved the completion of CQUIN targets integral to patient safety and care. This surgical admission proforma can easily be transferred for use in any other EGSU.

## Audit and Outcomes Research 0904

### A Thorough Note: Does a Procedure-Specific Operation Note Proforma Improve Compliance with the Royal College of Surgeons Guidelines?

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John Radcliffe Hospital

**Aims:** Operation notes provide an insight into the operative process and stand as a legal document of a surgical procedure occurring. Maintaining accurate, complete and legible notes is fundamental for post-operative patient care and medico-legal purposes.

The study aimed to compare the quality of laparoscopic appendectomy operation notes prior-to and after introduction of a procedure-specific proforma against the Royal College of Surgeons of England (RCSEng) guidelines, 2014. We assessed: (i) the overall compliance with the RCSEng guidelines (ii) whether RCSEng guidelines recommendations were clearly recorded in the operation notes (iii) legibility of operation notes.

**Methods:** Nineteen recommendations recorded in the RCSEng 'Good Surgical Practice' guidelines were used to audit laparoscopic appendectomy operation notes. The study consisted of a retrospective audit of the operation notes for all laparoscopic appendectomies performed in November and December 2013 in a busy teaching hospital and a prospective re-audit of operation notes following the introduction of a procedure-specific proforma (existing both in paper and electronic versions) in November and December 2014.

**Results:** Retrospective (before proforma): 43 patients 0% were 100% compliant to guidelines.

Range was 10/19 (52.6%) to 15/19 (78.9%) points clearly recorded. Mean 54%. Median 68%.

Prospective (with proforma): 57 patients 33% were 100% compliant to guidelines. Range 16/19 (84%) to 19/19 (100%) points clearly recorded Mean 94% Median 95%. Average compliance with RCSE guidelines increased from 54%

retrospectively to 94% prospectively. Median: 68% retrospectively vs. 95% prospectively. After introduction of the procedure-specific proforma 100% adherence to the RCSEng guidelines was increased from 0% to 33%. Average score legibility of operation notes increased from 95% to 100%.

**Conclusions:** The implementation of a procedure-specific operation increased compliance with RCSEng guidelines and enhanced documentation of each of the nineteen recommendations. Such proformas may help reduce variability and standardise operation notes for the same procedure as well as improve post-operative care.

## Audit and Outcomes Research 0914

### The use of a co-Morbidity Checklist Improves Accuracy in Diagnosis Coding

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Leicester HPB Unit

**Aims:** We observed frequent clerical inaccuracy in coded diagnoses for patients treated in our busy HPB unit, which resulted in inaccurate payments for services we provided. A new initiative to improve this was introduced - a co-morbidity coding checklist which was completed on discharge. In addition, junior doctor education on coding was increased and a weekly coding meeting was initiated between coders and clinicians. The checklist required the primary diagnosis to be stated clearly in addition to any secondary diagnoses, procedures performed, co-morbidities and other relevant information influencing payments. This audit aimed to assess general compliance with the checklist and its effect on improving the coding accuracy of Hepatobiliary patients.

**Methods:** A retrospective audit of case-notes in June 2014 was conducted. 50 patients were randomly selected. A mixture of elective and emergency admissions, spread across the month under several consultants' care were included to help ensure a true reflection of the unit's practice. In each case we recorded whether the checklist had been correctly completed, and the clinical diagnoses as interpreted from the notes by two doctors. We then obtained the relevant coding data and made a comparison to infer accuracy.

**Results:** The checklist was completed in 50% of patients. Our diagnoses matched the coded diagnoses in 90% of cases. Of the 10% of patients whose diagnosis was inaccurately coded, none had had a completed checklist.

**Conclusions:** The combination of the introduction of a co-morbidity checklist, targeted junior doctor training and regular meetings with clerical coding staff has improved the coding accuracy in our unit, therefore increasing economic efficiency and appropriate use of resources. To increase compliance with the checklist to 100% we have since added its components as mandatory fields to the electronic discharge summary.

## Audit and Outcomes Research 0919

### Quality of Operation Note Documentation in a Plastic Surgery Tertiary Centre - A Prospective Completed Audit Cycle

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Queen Victoria Hospital

**Aims:** Documentation on the operation note should be legible, complete and should adhere to the Royal College of Surgeons (RCS) guidelines (Good Surgical Practice, 2008). This information not only facilitates post-operative management but has become an important medico-legal document. The aim of this study was to assess the effects of medical record-keeping guidance on the standard of operative documentation.

**Methods:** A prospective audit of operative documentation for patients undergoing elective and trauma plastic surgery procedures, during a 2-week period in April 2014 and October 2014, within a plastic surgery unit was performed. Guidance outlining medical record keeping and operation note documentation was subsequently introduced to induction teaching with an accompanying poster of the required standards before re-auditing.

**Results:** 34 cases were included in the initial audit and 45 cases in the re-audit. 100% of cases had the operative procedure, post-operative instructions and a

signature documented in both audits. Operative surgeons were documented in 88% of the initial audit and 97% of the re-audit. Operative findings were recorded in 90% of the initial audit and 100% of the re-audit. Re-audit documentation of legibility increased to 93% from 65% and documentation of priority improved to 60% from 44%.

**Conclusions:** The operation note is a crucial medico-legal document and ensures continuity of care. The newly implemented guidance regarding medical record-keeping and operation note documentation has improved compliance of operative documentation as per RCS guidelines. We have highlighted the importance of educating surgeons on this topic at induction so they are fully aware of the need to accurately complete this document.

## Audit and Outcomes Research 1001

### Clinical Relevance and Adequacy of Bleeps During Foundation Year 1 Surgical On-Call

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**Aims:** There have been a number of issues raised concerning the relevance of bleeps received during an on-call period by surgical foundation year 1 doctors. This included day jobs not being completed, poor quality handover of jobs and inadequate use of SBAR tool (situation, background, assessment, recommendation). The aim of our audit was to formally assess an array of on-call bleeps and evaluate their quality and significance during out of hours period.

**Methods:** Prospective data was collected over a 7 day period of bleeps received by surgical FY1s during the out of hours oncall period. Information regarding the bleep requests was documented on pre laid proformas. These included, the health professional bleeping, information handed over, use of structure and a subjective score (1-5) of the bleep's relevance during out of hours period. Quality of handover was standardised against 'SBAR' framework advocated by NHS Institute of Innovation and Improvement (2008).

**Results:** 78 bleeps were collected during the study. 10 (12.8%) bleep requests could have waited for the day-team to review. 31 (39.7%) bleep requests should have been completed by days team before the on-call period. Consequently, 53% of bleeps received during on call period potentially did not require FY1 on call input. 28% of bleeps scored 1-2 out of 5 in relevance scale. Only 17% of bleep requests used all 4 components of SBAR tool when handing over information.

**Conclusions:** The On-call is an urgent/emergency service however; our findings have displayed a misuse of the oncall resources as a continuation of a non-urgent service. It is essential that all handovers use SBAR framework to ensure a quality handover and enable the on-call doctor to prioritise effectively. A re-audit will be completed with the use of a trial ward based bleep book to evaluate service improvement.

## Education and Training 1008

### Surgical Handover Practice amongst Junior Doctors in a District General Hospital: An Audit

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Milton Keynes Hospital

**Aims:** Our aims were to audit handover practice in the Department of Surgery, to assess and improve the perception of handover, thus ensuring patient safety and ultimately implementing the surgical handover as an educational tool. The 1st audit cycle was performed in September 2014. Based on our results, a number of recommendations were made including: formal induction, handover training, a new master list for the weekend, a designated Consultant lead and allocation of a specific handover room with IT facilities.

**Methods:** This audit used the same questionnaire-based survey as the 1st cycle, designed in line with the guidelines of the Royal College of Surgeons of England and the British Medical Association. The surveyed population included all Surgical FY1s, SHOs and Registrars.

**Results:** 20 and 24 questionnaires were completed in cycles 1 and 2 respectively. This audit demonstrated a higher level of satisfaction in cycle 2, 71%

[compared to cycle 1, 60%], 92% perceived a designated clinical lead, 55% in cycle 1. 75% were satisfied with the Master List, 50% in cycle 1. 83% were aware of the prioritisation of tasks, compared with 50% in cycle 1.

In addition: Regular Consultant attendance was recorded, 67% deemed it of educational value, 35% in cycle 1, A specific handover room with IT facilities was provided, 50% received formal handover training.

**Conclusions:** Handover is defined as 'the transfer of professional responsibility for some or all aspects of care for a patient, to another person or professional group on a temporary or permanent basis'. This audit has identified a vital need for the formal training of handover skills to junior doctors, with an induction workshop scheduled for February. A Surgical Division Welcome Pack has also been created, to encourage a multidisciplinary approach to handover and maximise educational opportunities.

## Education and Training 1023

### Use Of Facilitated Reflection on Structured Feedback to Promote Accelerated Acquisition of Surgical Procedural Skills

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*Imperial College*

**Aims:** Surgical training is in a state of flux and in particular there has been a decrease in the volume and frequency of opportunity to gain experience and training in procedural skills. If trainees are to gain sufficient expertise in the current system, despite more limited exposure, the efficiency of the training must be increased. This project aimed to investigate the impact of facilitated reflection on previously delivered feedback on accelerating skill acquisition.

**Methods:** Eighteen undergraduates were randomised into three groups and received individual training on a laparoscopic simulator, before being assessed on a standardised task with objective scoring from simulator-derived parameters. One group then received no feedback, while the other two were provided with detailed feedback on their performance. All groups then returned after 48 hours to repeat the assessment task, with one of the groups who received feedback undertaking facilitated reflection on this feedback, prior to their repeat attempt. Their second attempt performance was then recorded and compared with their initial results.

**Results:** The students were assessed completing a standard component of a laparoscopic cholecystectomy procedure. The parameters assessed were time taken, percentage of the dissection completed, movements made and cautery time. At the second attempt, after any educational intervention, analysis confirmed that there was no improvement in the performance of the group who received no feedback. The group whom received feedback showed a significant improvement in the time taken to perform the task (p value - 0.028). The group whom undertook facilitated reflection on their feedback prior to their second attempt showed improvement of over 10% in all parameters. This reached statistical significance in two areas, time taken (p value - 0.028) and percentage of dissection successfully completed (p-value 0.046).

**Conclusions:** The results demonstrate that facilitating reflection on previously delivered feedback is an important educational intervention for accelerating procedural skill acquisition.

## Education and Training 1030

### Surgical Skills Training in Low Income Settings: Needs Assessment and Evaluation of the ASiT Foundation Skills in Surgery Course in Rwanda

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<sup>1</sup>Association of Surgeons in Training

**Aims:** Surgery remains neglected in global health priorities. Healthcare worker shortages combined with under-developed surgical training has compounded

this in many low-income settings. We describe the results of a training needs assessment and evaluation from the first international ASiT 'Foundation Skills in Surgery' (FSS) course in Rwanda, East Africa.

**Methods:** The 1-day course included principles of safe surgical technique, sterility and infection control, and practical basic surgical skills. The existing course was adapted for low-income settings, with accompanying needs assessments and evaluation materials. Six UK surgical trainees provided teaching, supported by 2 local organisers and the Chief of Surgery at the Central University Teaching Hospital in Kigali. Funding came from the Royal College of Physicians and Surgeons of Glasgow and the Royal College of Surgeons of England, with additional ASiT member donations.

**Results:** Over 2 days, 55 final year medical students were trained: 40 male (73%); mean age 24.6 years; mean 12 weeks previous surgical placement. 56% expressed surgical career interests. From the needs assessment, most frequent areas of previous training included sterile gowning and gloving (74.5%) and patient safety (49.1%); the most infrequently taught included knot tying (9.1%) and suturing (12.7%). 30.9% felt their surgical skills were insufficient for the first year of postgraduate practice; only 14.5% were confident with their practical surgical skills. Qualitative data highlighted lack of training opportunity and materials as barriers to learning. Following training, overall course satisfaction was rated 9.25/10. Qualitative feedback was positive, rating suturing and knot tying as the most useful taught components.

**Conclusions:** Given newly qualified Rwandan doctors immediately commence surgical practice, the needs assessment demonstrated urgent need for further training. Few examples of sustainable undergraduate surgical training initiatives in low-income settings have previously been described. Progressively increasing use of local faculty will ensure transfer of delivery locally.

## Audit and Outcomes Research 1060

### Sustained Improvement in Quality of Life (QoL) and Stable Pain Relief in Visceral Pain Patients Using Dorsal Root Ganglion (DRG) Stimulation

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*Leeds Teaching Hospitals NHS Trust*

**Aims:** Chronic pancreatitis is associated with up regulation of specific neuropeptides in the dorsal root ganglion (DRG) associated with nociception [1]. This makes the DRG a promising target for neuromodulation. We present data retrospectively collected in an abdominal pain cohort at our center, using a CE-marked technology that specifically targets the DRG, to demonstrate that it is an effective therapy to treat chronic intractable pain in this population.

**Methods:** Patients diagnosed with abdominal pain were trialed with specifically designed leads placed over the DRG (Picture). Patients were implanted with the Axiom<sup>®</sup> neurostimulator system if they had a successful trial phase ( $\geq 50\%$  pain relief). Pain relief and secondary outcomes, including quality of life measures and global impression of change, were captured. Data is presented as mean  $\pm$  standard deviation.

**Results:** Data from twenty patients were reviewed. Some of the diagnoses include pancreatitis (4), Crohn's disease (2), sphincter of oddi dysfunction (2), Budd-Chiari syndrome (1), and Xiphisternal pain (1). Seventeen patients had follow-up data. Leads were implanted between T7 and L1 DRGs. Mean follow-up was 8.5 months ( $\pm 5.4$ ). Baseline pain measured in visual analog scale (VAS) and EQ-5D-5 L index scores were 85.3 mm ( $\pm 15.0$ ) and 0.056 ( $\pm 0.309$ ), respectively. At last follow-up, VAS and index scores were 47.1 mm ( $\pm 17.6$ ) and 0.440 ( $\pm 0.341$ ), respectively. Eight patients (of the nine with data) reported either 'much improved' or 'very much improved' in Patient-Global Impression of Change (P-GIC) (5-point Likert) scale.

**Conclusions:** Given the role it plays in transduction of visceral pain, neuromodulation of the DRG may be a viable alternative in treating this condition. While controlled, prospective studies with long-term follow-up are required to validate these results, the observed outcomes nonetheless indicate that this technique may effectively treat abdominal visceral pain.

## Day Ambulatory Surgery

### General 0028

#### Is it Time to Revise the Guidelines for Antibiotic Prophylaxis in Hernia Surgery?

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**Aims:** The guidelines on antibiotic prophylaxis in hernia repair are based level 1 evidence for groin hernia repair and extrapolated to midline herniae. Diabetes, smoking and obesity are known to be associated with increased risk of surgical site infection (SSI). We examine the incidence of post-operative SSI in midline hernia repair compared with groin hernia repair to identify whether there is a difference and if there may be a role for antibiotic prophylaxis in patients with midline herniae

**Methods:** Patients undergoing both inguinal and midline hernia repair between September 2013–2014 were randomly selected. Patient demographics and incidence of surgical site infection were examined. SSI was defined as patients who returned to hospital, required surgical review and treatment with antibiotics +/- incision and drainage.

**Results:** 173 patients were identified (90 in inguinal hernia group, 83 in midline hernia group). Groups were similar for age median range - 40–70 ( $p < 0.0001$ ). BMI range was 18–35 and 18–45 in inguinal hernia vs midline hernia group respectively ( $< 0.0001$ ). 33 vs 28 patients were smokers in inguinal hernia vs midline hernia group. There were 3 diabetic patients in each group. There were significantly more SSIs in the midline group (9.6% v 4.4%;  $p = 0.02$ ).

**Conclusions:** In this study there were significantly more SSIs in the midline hernia repair group compared with the groin hernia repair group. However, patients with midline herniae were more likely to be obese and have their operations performed in the emergency setting. This may have contributed to their increased risk of infection. At present, there is no level 1 evidence regarding the use of prophylactic antibiotic prophylaxis in midline hernia repair. However the results of this cohort study suggest in these higher risk patients there may be a role.

### General 0057

#### Preoperative Scoring System to Predict Difficulty of Laparoscopic Cholecystectomy

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**Aims:** To develop a preoperative scoring model to assess difficulty of laparoscopic cholecystectomy (LC) and risk of conversion to open cholecystectomy (OC).

**Methods:** Retrospective analysis of patients underwent LC and LC converted to OC between 01/06/2013 and 01/06/2014. LC difficulty assessment based on operative time (OT) and conversion to OC. Preoperative factors included: age; ultrasound scan (USS) findings gallbladder (GB) wall thickness, other acute inflammatory signs e.g. pericholecystic fluid collection, common bile duct diameter and size of gallstones (GS); previous pancreatitis, Endoscopic Retrograde Cholangiopancreatography (ERCP) or Magnetic Resonance Cholangiopancreatography (MRCP). Preoperative weighted score for LC difficulty formulated based on degree of significance of preoperative factors.

**Results:** 280 patients included, of which 11 (3.9%) had conversion to OC. Univariate analysis showed a highly significant (HS) association between prolonged OT and USS findings of thick GB wall ( $P = 0.003$ ) and other acute inflammatory signs ( $P = 0.0001$ ); and a Significant (S) association with pancreatitis ( $P = 0.05$ ), ERCP ( $P = 0.027$ ) and MRCP ( $P = 0.016$ ). Conversion to OC had a HS association with thick GB wall ( $P = 0.001$ ) and other acute inflammatory signs ( $P = 0.0001$ ); and S association with age  $> 62.3$  ( $P = 0.015$ ) and large

GS ( $P = 0.035$ ). Score formulated as follows: 2 points for HS factors on the multivariate analysis (thick GB wall and other acute inflammatory signs) ( $P = 0.027$  and  $0.007$  respectively) and 1 point for each S factor (age  $> 62$ , large GS, pancreatitis and ERCP/MRCP). Sensitivity and specificity using ROC curve showed patients scoring  $< 2$  had a straightforward LC with OT  $< 63$  minutes and no conversions to OC; score  $\geq 2$  had a difficult LC with prolonged OT  $\geq 63$  minutes (sensitivity 46%, specificity 70%,  $P = 0.03$ ) but no conversion to OC and score  $\geq 4$  had more difficult LC with OT  $\geq 63$  minutes and with possible conversions to OC (sensitivity 73%, specificity 87%,  $P = 0.001$ ).

**Conclusions:** This scoring model can be used when planning operative lists to improve theatre efficiency, suitability for day surgery and appropriate allocation of the required surgical expertise.

reducing the number of patients experiencing recurrent episodes of pancreatitis, increased fistula or abscess recurrence rates), there could be considerable cost savings to the NHS and to patients, including reduced absence from work.

### General 0277

#### Independent Predictors of all Cause 30-Day Readmissions Following Cholecystectomy: a Contemporary, Multi-Centre, Prospective, Population-Based Cohort Study

CholeS Study Group\*

West Midlands Research Collaborative, Academic Department of Surgery, University of Birmingham

**Aims:** Some 70,000 cholecystectomies are performed every year in the UK alone. There is known to be variation in all cause 30-day readmission rate between hospitals. The aim of this study was to investigate the predictors of all-cause 30-day readmissions following cholecystectomies performed in 166 UK/Irish hospitals.

**Methods:** Prospective data following cholecystectomy performed in adult patients was collected between 1st March and 30th April 2014. Data points from 20% of patients were independently validated. Multivariable analysis was performed to generate odds ratios (OR, with 95% confidence intervals, CI) using selected pre- and peri-operative variables.

**Results:** Data on 8,914 cholecystectomies was returned representing 96.6% of all cholecystectomies performed in the hospitals studied. The returned data was 98.7% complete and 99.3% accurate. The number of all-cause 30-day readmissions across the cohort was 633 (7.1%). Independent predictors of readmission were: age (OR 0.99, 95% CI 0.98–0.99); an acute (OR 1.75, 95% CI 1.39–2.21) or delayed (OR 1.52, 95% CI 1.26–1.84) operation compared to elective operations; American Society of Anaesthesiologists (ASA) 2 (OR 1.28, 95% CI 1.05–1.56) or ASA 3 (OR 1.89, 95% CI 1.40–2.54) compared to an ASA 1 score; cholecystitis (OR 1.24, 95% CI 1.03–1.50) and pancreatitis (OR 1.37, 95% CI 1.05–1.79) compared to biliary colic; preoperative CT (OR 1.60, 95% CI 1.30–1.97) and open (OR 2.19, 95% CI 1.19–4.06) or converted (OR 1.88, 95% CI 1.29–2.73) compared to laparoscopic procedures. Sex of patient, grade of operating surgeon and bile spillage were not predictors of readmission.

**Conclusions:** Readmission following cholecystectomy is common and linked to pre- and peri-operative variables.

### Patient Safety 0309

#### Compulsory Completion of Venous Thromboembolism Prophylaxis Tool Fails to Ensure Good Practice

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Aintree University Hospital

**Aims:** Annually 25,000 potentially preventable deaths from hospital-acquired venous thromboembolism (VTE) occur in England. Current preventative

measures include: mechanical prophylaxis and pharmaceutical prophylaxis (typically low molecular weight heparin (LMWH)). Our institution launched a VTE assessment tool in November 2011: all hospital admissions must undergo prophylaxis evaluation at admission. The aim of this study is to assess compliance of all hospital admissions against the standards of: 1) completion of the VTE proforma and 2) prescription of LMWH at admission when indicated.

**Methods:** A prospective analysis of the electronic medical and prescribing records of all elective and emergency hospital admissions over a 7-day period from midnight 13<sup>th</sup> November 2014 was performed. Compliance with VTE proforma completion and LMWH prescription standards were assessed. The timing of each was also evaluated.

**Results:** 659 patients were admitted (199 elective and 460 emergency) during the study period. 492 patients (74.7% of admissions) had a VTE form completed. LMWH was indicated in 328 cases but only 269 (82% of indicated) of these had LMWH prescribed. Furthermore, of these 328 patients, 161 missed at least the first dose either due to delayed assessment (45.7%) or delayed prescribing (3.4%). 49 of the 659 admissions (7.4%) received LMWH without assessment and 81 (12.3%) were retrospectively assessed after LMWH prescription.

**Conclusions:** This study shows that VTE risk assessment is not being appropriately performed at hospital admission and that prescribing in response to the assessment outcome is also poor. Overall, only 142 of the 659 (21.5%) admissions had appropriate VTE assessment and risk management.

## Audit and Outcomes Research 0328

### Unexpected Admissions as Key Performance Indicator in Day Surgery Unit

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Connolly Hospital, Blanchardstown

**Aims:** Audit Day Surgery Unit (DSU) activity and identify the rate and reasons for unexpected admissions across all specialities in a single RCSI Teaching Hospital.

**Methods:** Retrospective data were retrieved from DSU records from 1<sup>st</sup> January 2013 to 31<sup>st</sup> December 2013.

**Results:** A total of 3411 procedures were done; General surgery 1797 (52.7%), Orthopaedics 668 (19.6%), Urology 297 (8.7%), Plastics 271 (7.9%), Dermatology 149 (4.3%), Dental 92 (2.7%), Gynaecology 65 (1.9%), Radiology 56 (1.6%), Anaesthetics 14 (0.4%), Endocrine 1 (0.1%). There were 1384 local cases (40.6%) and 2026 sedation / general cases (59.4%). The later were divided into: General surgery 1307 (72.7%), Orthopaedics 304 (45.5%), Urology 153 (51.5%), Plastics 61 (22.5%), Dermatology 0 (0%), Dental 92 (100%), Gynaecology 66 (100%), Radiology 34 (60.7%), Anaesthetics 9 (64.3%), Endocrine 0 (0%), 130 unexpected admissions (6.4%) were identified; General Surgery 72 (5.5%), Orthopaedics 36 (11.8%), Urology 6 (3.9%), Plastics 5 (8.1%), Dermatology 0 (0%), Dental 1 (1.1%), Gynaecology 4 (60.6%), Radiology 6 (17.6%), Anaesthetics 0 (0%), Endocrine 0 (0%). Common reasons for unexpected admissions were; Medical causes 51 (38.6%), Administrative error 37 (28%), late procedure 17 (12.9%), pain 12 (9.1%), nausea and vomiting 8 (6.1%) and social reasons 5 (3.8%).

**Conclusions:** Unexpected admissions were 130 (6.4%) which is above the recommended target of < 2% (British Association of Day Surgery). Most cases were preventable but some were inevitable. The lack of a dedicated pre assessment clinic was a major factor. Local cases constituted a large work load. Recommendation: Strict adherence to preoperative assessment and post operative nurse led protocols, local cases should be managed separately, compliance with protocols and re-auditing is essential.

## General 0362

### Role Of Prophylactic Antibiotics in Elective Laparoscopic Cholecystectomy: A Critical Appraisal Based Upon the Principles of Meta-Analysis

M. S. Sajid\*, A. H. Khawaja, M. R. McFall, M. Sayegh, K. K. Singh

Western Sussex Hospitals NHS Foundation Trust, Worthing Hospital

**Aims:** The objective of this article is to evaluate the role of prophylactic antibiotics in preventing the infective complications in patients undergoing elective laparoscopic cholecystectomy (ELC).

**Methods:** A systematic review of the literature on the published randomized, controlled reporting the role of prophylactic antibiotics in preventing the infective complications in patients undergoing ELC was undertaken using the principles of meta-analysis.

**Results:** Twenty-five RCTs on 6138 patients evaluating the infective complications in patients undergoing ELC were systematically analysed. There were 3099 patients in antibiotics group and 3039 patients in no-antibiotics group. The risk of surgical site infection [odds ratio, 0.75 (CI, 0.52–1.07, p=0.11), distant infection [odds ratio, 0.66 (CI, 0.21–2.14, p=0.49) and residual abscess [odds ratio, 0.93 (CI, 0.23–3.81, p=0.92) was lower in the antibiotics group but statistical significance was not reached. However, the risk of overall all type infective complications were statistically lower [odds ratio, 0.69 (CI, 0.50–0.95, p=0.02) in the antibiotics group. Consequently, the length of hospitalization was found to be shorter [standardized mean difference, -0.32 (CI, -0.54, -0.10, p=0.004) in the antibiotics group.

**Conclusions:** Use of prophylactic antibiotics at the time of induction in patients undergoing ELC has clinically proven advantage of reducing the post-operative infective complications.

## General 0428

### A Systematic Review Comparing Single Port Versus Multiport Laparoscopic Inguinal Hernia Repair With Mesh

M. S. Sajid\*, A. H. Khawaja, M. Sayegh, W. F. Miles, K. K. Singh

Western Sussex Hospitals NHS Foundation Trust

**Aims:** The objective of this article is to evaluate whether surgical outcomes differ between single port (SP) versus multiport (MP) conventional laparoscopic repair of inguinal hernia.

**Methods:** A systematic review of literature on published trials reporting the surgical outcomes following SP versus MP laparoscopic inguinal hernia repair was undertaken using the principles of meta-analysis.

**Results:** Sixteen comparative trials (3 RCTs, 7 prospective and 6 retrospective studies) on 1696 patients evaluating the surgical outcomes in patients undergoing SP versus MP laparoscopic inguinal hernia repair were systematically analysed. There were 880 patients in SP group and 816 patients in MP group. In the MP group, the duration of the operation (approximately 9 minutes) as well as recovery time (approximately 5 hours) were statistically longer compared to SP group. However, the statistical equivalence was seen in outcomes of length of hospital stay, post-operative pain score, one-week pain score, recurrence [odds ratio, 1.24 (CI, 0.47–3.23), p=0.66], conversion [odds ratio, 1.07 (CI, 0.37–3.12), p=0.90], and post-operative complications [odds ratio, 0.95 (CI, 0.66–1.36, p=0.78) between two approaches of the laparoscopic inguinal hernia repair.

**Conclusions:** Both SP and MP approaches of laparoscopic inguinal hernia repair are feasible, safe and can be offered to patients depending upon the availability of expertise and resources.

## Minimally Invasive Surgery 0444

### Is Routine Group and Save Indicated for Day Case Laparoscopic Surgery?

P. Thomson\*, J. Ross, S. Mukherjee, B. Mohammadi

University College Hospital

**Aims:** Common day case laparoscopic procedures are usually safe, with low rates of bleeding complications. At our trust most patients undergo pre-operative group and save (G&S) for these procedures, at a cost of £18.39 per sample excluding laboratory staffing costs.

Our aim was to assess if routine pre-operative G&S is indicated by assessing whether patients undergo peri-operative blood transfusion following laparoscopic cholecystectomy, laparoscopic inguinal hernia repair and diagnostic laparoscopy.

**Methods:** We performed a retrospective review of all patients who underwent laparoscopic cholecystectomy, laparoscopic inguinal hernia repair and diagnostic laparoscopy from April 2012–March 2014. Patients were identified using hospital coding records. Transfusion department records were reviewed to see which patients had undergone pre-operative G&S or cross-match, and peri-operative blood transfusion.

**Results:** 532 procedures were performed in 2 years. 0 patients were transfused for bleeding complications. 1 patient was transfused post-operatively to optimise known pre-operative anaemia.\*

Procedure: n / G&S (%) / Crossmatch (%) / Transfused (%). Laparoscopic cholecystectomy: 293 / 256 (87) / 8 (3) / 0. Laparoscopic inguinal hernia repair: 123 / 67 (54) / 2 (1.6) / 0. Diagnostic laparoscopy: 116 / 88 (76) / 6 (5) / 1\* (0.9). Total G&S cost £7558.

**Conclusions:** The transfusion rate for bleeding complications following laparoscopic day case surgery is 0% in our unit. G&S samples cost £7558 over 2 years. Abandoning pre-operative G&S appears to be clinically indicated and would lead to substantial financial savings.

## General 0449

### Does The Financial Cost Implication of Routine Histopathology of Cholecystectomy Specimens Outweigh the Benefit to Patient Care Within the NHS?

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*Ealing Hospital*

**Aims:** Routine histology requests for cholecystectomy specimens despite normal gross morphology are performed in accordance with the Royal College of Pathologists Guidelines published in 2005. However, gallbladder carcinoma is rare and a small proportion of cholecystectomy specimens are found to have cholangiocarcinoma or other malignancy.

**Methods:** A literature search and histopathology report review from our hospital was performed. This included all patients undergoing cholecystectomy between June 2011 and September 2014. The results of routine histopathology reports of cholecystectomy specimens were collected retrospectively from the internal pathology department database. A detailed cost breakdown of a standard cholecystectomy histopathology test was calculated within the department.

**Results:** Between June 2011 and September 2014, 699 patients received cholecystectomy and routine histopathology of gallbladder specimen. Low grade dysplasia was detected in 0 patients (0.00%), high grade dysplasia was detected in 1 patient (<0.01%) and gallbladder malignancy was detected in 2 patients (<0.01%). Of the 2 malignancies, only 1 patient had evidence of lymph node metastasis (0%). Both cases of malignancy were identified with gross macroscopic assessment by the operating surgeon at the time of surgery. The cost of routine cholecystectomy histopathology analysis was calculated as £128 per patient case, inclusive of tissue processing and examination by consultant pathologist.

**Conclusions:** We recommend a selective approach to gallbladder histology based on a macroscopic assessment by the operating surgeon to reduce unnecessary histology requests and cost burden to the NHS. Routine histopathology of macroscopically normal cholecystectomy specimens is unlikely to alter subsequent clinical management, however, further studies are needed.

## General 0479

### Causes and Effects of Variation in Practice of Cholecystectomy: a multi-centre, prospective, population-based cohort study

CholeS Study Group\*

*West Midlands Research Collaborative, University of Birmingham*

**Aims:** Over 66,000 cholecystectomies are performed in the UK every year. Patients follow one of three pathways: ‘acute’ operation during the index admission; ‘delayed’ operation on a scheduled basis following discharge after an acute admission; or ‘elective’ operation with no prior acute admission. Retrospective population-based studies show wide variation in the proportions of each, but lack sufficient risk stratification data to understand why such

variations occur. The aim here was to (1) investigate patient, disease, surgeon and hospital factors that result in different practices of cholecystectomy and (2) determine the effect on 30-day complications.

**Methods:** Prospective data following cholecystectomy performed in adult patients was collected from 166 UK and Irish hospitals between March and April 2014. Data points from 20% of patients were independently validated. Data was analysed using multivariable regression modelling. Only factors with a <0.001 are presented below.

**Results:** Data on 8,909 cholecystectomies were returned representing 96.6% of all cholecystectomies performed in the hospitals studied. The returned data was 98.7% complete and 99.3% accurate. The numbers of acute, delayed and elective operations were 1,451 (16.3%), 3,293 (37.0%), and 4,165 (46.7%) with variation between 0% and 100% across the 166 hospitals. Certain hospital (increasing numbers of beds, University hospitals, tertiary HPB services and ‘acute’ gallbladder lists) and surgeon (consultant presence and increasing numbers of consultants performing cholecystectomy) factors resulted in increasing numbers of elective operations performed by hospitals. While similar hospital and surgeon factors increased the proportion of delayed rather than acute operations by hospitals, patient (increasing age) and disease (indication, radiology findings, and need for imaging or interventions) factors were also important. Only patient, disease and hospital factors independently predicted 30-day complications when stratified by patient pathway.

**Conclusions:** Patient, disease, surgeon and hospital factors identified here result in the wide variation seen in the practice of cholecystectomy. These factors impact on outcomes.

## Hernia/Soft Tissues 0574

### Laparoscopic Inguinal Hernia Repair in England is increasingly Performed but with Wide Variation in Regional Availability

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**Aims:** To identify the proportion of laparoscopic inguinal hernia repairs performed in England and the variation in regional / hospital availability between 2009–2014.

**Methods:** Data was obtained from the Surgical Workload Outcome Research Database (SWORD). Data was examined for unilateral, bilateral and recurrent inguinal hernia repairs.

**Results:** NHS England Hospital Episode Statistics Data from 378,624 hernia repairs performed in England between 2009–2014 was analysed. Rates of laparoscopic repair increased for unilateral (15.1% to 16.4%), bilateral (27.8% to 30.9%) and recurrent repairs (56.4% to 65.8%). There has been an increasing proportion performed as day case procedures (unilateral (67.8% to 78.3%); bilateral (55.2% to 67.9%) & recurrent (56.7% to 68.4%)) with no change in 30-day re-admission and re-operation rates. Wide variation exists between NHS trusts in availability with the proportion of laparoscopic repairs offered in various trusts ranging from 0–92.7% for unilateral, 2.5–98.6% for bilateral and 0–76.4% for recurrent repairs.

**Conclusions:** This is the first report describing the proportion and regional /hospital variation in laparoscopic inguinal hernia repairs in England. There has been a steady increase in the number of procedures performed laparoscopically, and this is most marked in bilateral and recurrent repairs. There is striking variation in the rates of laparoscopic repair between hospitals in England, and thus availability and choice for individual patients is highly variable - another example of the healthcare post-code lottery. Further work to identify if this widespread variability is due to insufficient surgical training, local funding/cost issues or surgeon/patient preference is required. This data has implications for general surgical training and healthcare resource planning across England.

## General 0735

**Role of Intra-Operative Cholangiograms In Patients with Obstructive Jaundice: A Review of a Consecutive Series of Patients**A. Qureshi<sup>1\*</sup>, A. Musbahi<sup>2</sup>, A. Mirza<sup>2</sup>, H. Qandeel<sup>2</sup>, A. Nasser<sup>2</sup><sup>1</sup>University of Glasgow, <sup>2</sup>Monklands Hospital

**Aims:** Intraoperative cholangiograms (IOC) are performed to identify biliary anatomy and common bile duct (CBD) pathology. Deranged liver function tests and common bile duct dilatation are markers of choledocholithiasis. We aimed to review the risk factors and outcome of patients with suspected CBD stones with normal and abnormal IOCs during laparoscopic cholecystectomy (LC).

**Methods:** Data was obtained from a series of 2935 laparoscopic cholecystectomies with routine IOC performed at a district general hospital. Only patients with jaundice at time of presentation and subsequent IOC during LC were included in the review and analysed for underlying disease and imaging findings.

**Results:** The total number of patients with jaundice who underwent LC and IOC were n = 337. 43 (13%) patients with jaundice had normal IOC. 17 (40%) of patients with normal IOC had an identifiable underlying pathology, cholecystitis (n = 1), fundal mass (n = 1), cholangitis (n = 6), pancreatitis (n = 7), empyema of the gallbladder (n = 2). False negative IOC's were seen in 15 patients (n = 2 in patients with normal IOC). The common bile duct stones were removed from 196 (58%) and cystic duct stones were removed from 27 (8%) patients. There were 294 abnormal cholangiograms, filling defects (173), dilated ducts (96) stricture (6) and abnormal ductal anatomy (19).

**Conclusions:** In patients with clinical jaundice IOC can be safely and routinely performed with laparoscopic cholecystectomy. It helps in the identification of CBD stones, recognition of bile duct injuries and the facilitation of single stage management of CBD stones

## Audit and Outcomes Research 0761

**The Advent of Ward-Based Ultrasonography: Facilitating a Reduction in Time to Management Outcomes**S. H. Abbas<sup>\*</sup>, S. Singh, S. M. Kouris, S. Huf, J. Gilmour*John Radcliffe Hospital*

**Aims:** To evaluate the impact of ward-based ultrasonography on the general surgical admission pathway. The following parameters were assessed: (i) time of ultrasound booking to report and subsequent clinical decision or outcome (ii) clinical outcomes (iii) potential cost benefits.

**Methods:** A prospective comparison was made between the trial of a new ward-based ultrasonography service and the usual service where patients attended the radiology department when allocated a time. During the 5 day trial of the new service all ultrasound scans requested for emergency general surgery patients were performed on the surgical admission ward without need for transport to the radiology department. All emergency general surgery patients requiring an ultrasound scan during two different 5 day - weekday periods from November 2014 onwards were included in the study.

**Results:** Study group (ward-based scans): n = 22

Booking to report: 527 minutes (mean) 192 minutes (median) 4–1426 minutes (Range)

Control group (radiology department based scans): n = 29

Booking to report: 718 minutes (mean) 584 minutes (median) 30–5351 minutes (Range)

The average time of ultrasound request to report was reduced. No patient in the study group had to wait longer than 24 hours for an ultrasound scan.

The maximum waiting time for patients in the study group was reduced by 3925 minutes. Additionally, the average time of report to clinical decision or outcome was reduced by 228 minutes.

The main clinical outcomes included discharge, further imaging, operative procedure and specialty referral.

The new service had potential costs benefits due to reduction in portering times.

**Conclusions:** The new service reduced the time from booking to reporting of scans and consequently advanced clinical decision making and outcomes compared to the existing service. It has potential cost benefits, enhances the patient admission pathway and prevents delays to diagnosis and management.

## General 0828

**Developing an Acute Biliary Service for Definitive Management of Gallstone Pancreatitis**T. Murphy<sup>\*</sup>, S. K. Richards*Royal United Hospitals Bath, NHS Foundation Trust*

**Aims:** The British Society of Gastroenterology (BSG) guidelines for the management of acute gallstone pancreatitis recommend that patients should have definitive surgery (laparoscopic cholecystectomy) within two weeks of index admission. We sought to establish whether the introduction of an Acute Biliary Service using an ambulant pathway with urgent bookable theatre slots would improve management of this group of patients.

**Methods:** We retrospectively collected data over a 7 month period (01/11/2013–31/05/2014) on all patients admitted with biliary pancreatitis. Time to surgery was measured from confirmation of diagnosis on USS. All readmissions in the interim period were noted and data was compiled on the wait for ancillary imaging (MRCP), ERCP and mortality.

**Results:** Over the time period 47 patients were admitted to our centre with confirmed biliary pancreatitis. A complete data set was analysed in 45 (96%) patients. 27 (60%) patients had definitive surgery, 15 (33%) were deemed 'not fit' or declined surgery. There was a single patient death (during the acute admission), one patient had surgery elsewhere and one still awaits surgery. 12 (44%) of patients requiring surgery were referred to the Trust's newly established Acute Biliary Service. This cohort of patients waited an average of 15.6 days (range 2–35 days) to operation from diagnosis. However, 15 patients (56%) were managed via the traditional pathway and put on the standard waiting list, waiting an average of 115 days (range 4–230 days) for surgery. 4 (9%) patients were readmitted with acute pancreatitis in the interim period, all of which were in the traditional pathway group.

**Conclusions:** An Acute Biliary Service can improve the timely definitive management of acute biliary pancreatitis. This Service Improvement Project will now focus on education of stakeholders to encourage an increase in referrals thus reducing the number of patients experiencing recurrent episodes of pancreatitis.

## Audit and Outcomes Research 0845

**A Dedicated Ambulatory Care Unit Pathway for the Management of Uncomplicated Biliary Disease**M. Dunne<sup>\*</sup>, A. Hussein, J. Wilson, A. Choy*Peterborough City Hospital*

**Aims:** In September 2013, we introduced a specific pathway for the assessment of patients presenting with suspected biliary colic. This pathway utilised the Ambulatory Care Unit (ACU) and was intended as a means of early diagnosis of gallstones without the need for admission. We analysed the first 6 months to determine whether it was being used safely and appropriately, and furthermore, whether it conferred any measurable service improvements.

**Methods:** Patients presenting to the emergency department with right upper quadrant pain, meeting the inclusion criteria were given an ACU appointment, usually for the following day, where they underwent abdominal ultrasound and consultant review. We retrospectively compiled a dataset for all patients who used the Biliary Colic ACU pathway during a six month period from September 2013 to March 2014. Hospital IT systems were used to gather information on compliance with pathway criteria and patient outcomes.

**Results:** 27 patients were assessed on the pathway during the period analysed. The mean time to appointment (and ultrasound) was 1.3 days. 14 patients (51.8%) were confirmed to have gallstones; of these, 3 were booked directly for elective laparoscopic cholecystectomy, while the remainder were given an outpatient appointment. None of the patients required admission from ACU. Of the 13 patients that did not have identifiable biliary disease, 4 were offered further investigation or follow-up while the remainder were discharged.

**Conclusions:** The ACU is an ideal forum for the investigation of uncomplicated biliary disease. It offers an alternative to admission, early diagnosis with prompt ultrasound and consultant review for decision-making regarding further management of patients with and without gallstones. Our service could

be further improved by increasing the number of patients booked directly for elective laparoscopic cholecystectomy. increased fistula or abscess recurrence rates), there could be considerable cost savings to the NHS and to patients, including reduced absence from work.

## General 0942

### Blood Group and Save for Elective Laparoscopic Cholecystectomy

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**Aims:** Almost 60000 cholecystectomies are performed in UK every year. The standard practice for elective laparoscopic cholecystectomy (ELC) is to group and save blood pre-operatively irrespective of clinical condition of the patients. It costs around £1.2 million to group and save for ELC every year. There is no national guidance for group and save in UK. This study is aimed to identify the rationale behind the requirement for group and save in ELC.

**Methods:** A retrospective analysis of 3 years data for ELC was done. The data was collected from theatre and blood bank. The local policy in the hospital where the study was conducted suggests to group and save blood for ELC. The patients who had cholecystectomy performed as an additional procedure to any other intrabdominal procedures were excluded from the study.

**Results:** Total number of ELC performed in 3 years was 1236 by 15 consultants. 746 patients (60%) had group and save done pre-operatively. Five patients (0.4%) required blood transfusion related to the ELC. Four of them required blood transfusion in immediate post-operative period and 1 patient required it on 11 th day after surgery. None of the patient required transfusion intra-operatively.

112 emergency cholecystectomies were also performed in the same period. Three patients (2.7%) required blood transfusion, 2 patients had post-operative and 1 patient had intra-operative blood transfusion.

**Conclusions:** The blood transfusion for ELC is rarely required. Not only due to financial implications but also due to extra work load on blood bank, group and save for ELC is not justified. The cost of group and save could be saved. Targeted approach by filtering the patient by identifying the risk factors in pre-operative check clinic will reduce the burden on blood bank services. Emergency cholecystectomy does warrant group and save. Development of national level guidance for group and save will be needed.

## Audit and Outcomes Research 0945

### A Prospective Audit of Surgical Consent Forms Reveals Suboptimal Practice - a Role for Electronically-Generated Procedure-Specific Forms?

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**Aims:** The Department Of Health advises that there is a general legal and ethical mandate to obtain informed consent before a surgical procedure. Consent forms serve as the basis for discussion of a procedure's risks and benefits and provide documented evidence of the consent process. We performed a prospective audit to assess the completion of standard, hand-written consent forms and subsequently designed an application to generate electronic procedure-specific forms: OpInform.com.

**Methods:** Between January 2013 and December 2014 hand-written consent forms for surgical procedures were prospectively audited in a blinded fashion

across specialities at three NHS Trusts. Assessed criteria comprised the completion of individual form responses that were recorded as correct, incorrect, illegible or blank. Free text entries for procedure risks were also recorded. Discrete responses were categorised into three domains (patient details, procedure details and patient sign-off) and domains were considered to be 'failed' if a contained element was not correctly documented.

**Results:** 238 consent forms were prospectively audited during the study period. The failure rates for each domain were: patient details, 29%; procedure details, 37%; and patient sign-off, 16%. An illegible response was the commonest reason for failing a domain, accounting for 70% of failures. Mastectomy was a common procedure (~10%) and was therefore used as a reference to assess documentation of procedure complications. A total of 19 potential complications were documented for this procedure across all forms, with a median of 7 and a range 3–11. Only 22% of forms documented the ubiquitous complications of infection, bleeding, scar and venous thromboembolism.

**Conclusions:** Completion of standard hand-written consent forms suffers from wide variation and is frequently suboptimal. These problems stem primarily from a lack of standardisation amongst the individuals completing the forms and illegible handwriting. We will re-audit, using electronically-generated procedure-specific forms, to determine if these can improve the quality of consenting practice.

## General 0956

### A Prospective Evaluation of Risk Factors for Post-Operative Urinary Retention Following Day-Case General Surgery.

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*Imperial College London*

**Aims:** Post-operative urinary retention (POUR) is a well-recognised complication of day-case general surgery that causes patient discomfort and often involves urethral catheterisation with its associated risks. Furthermore, POUR typically leads to an unplanned overnight admission that can have a negative impact upon the delivery of elective and emergency services. Our current knowledge base concerning the development of POUR is based almost exclusively on retrospective analyses - this study aims to provide prospective data on risk-factors for the development of POUR following ambulatory general surgical procedures.

**Methods:** Between May and October 2014 consecutive adult patients undergoing elective day-case general surgical procedures (excluding those involving the genitourinary tract) were prospectively included in the study. Collected data included patient demographics, medical and pharmacological history and intra-operative and anaesthetic details. POUR was defined as the requirement for urinary catheterisation or an unplanned overnight hospital admission because of an inability to void within 24 hrs of surgery.

**Results:** 533 patients were eligible for inclusion and data were collected for 388 patients (73%). The incidence of POUR was 3% (n=12). Age > 50 years and laparoscopic abdominal surgery were found to increase the risk of POUR (RR 5.66, p=0.02 and RR 4.15, p=0.01 respectively). However, male sex (RR 0.64, p=0.44), a history of prostate disease (RR 0.31, p=0.41) and the use of alpha-blockers or 5-alpha reductase inhibitors were not associated with the development of POUR. For patients undergoing open inguinal hernia repair, the use of local anaesthetic nerve block did not increase the risk of POUR (RR 2.52, p=0.41).

**Conclusions:** Age > 50 years and undergoing a laparoscopic abdominal procedure are significant risk factors for the development of POUR following day-case general surgery. Neither male sex nor a history of prostate pathology appeared to increase the risk of POUR but the study is currently underpowered due to the low overall incidence of POUR.

## Lower GI General Surgery

### General 0071

#### Triaging Colorectal Referral Letters in a Busy Tertiary Centre for Colorectal Surgery

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University Hospital of North Staffordshire

**Aims:** There is an increase demand for reducing waiting times for Outpatient-appointments. Our current policy is to review all referred patients in clinic. The aim is to investigate if triaging referral letters reduces the number of appointments.

**Methods:** Randomly selected referral letters between Jan-Sept 2013 were independently triaged by a Colorectal Nurse Specialist (CNS) and a Consultant Colorectal surgeon as 1-Clinic, 2-Flexible Sigmoidoscopy/Colonoscopy, 3-OGD/CTC. The triage outcome was compared with the clinic outcome. Cohen's kappa coefficient was used to calculate the inter-rater agreement.

**Results:** 50 letters were triaged and there was a 92% (n = 46) outcome agreement ( $\kappa = 1.00$ ) between the CNS and Consultant. The letters were categorised by the 2 raters as; CNS(Rater-1): 1-33, 2-11, 3-6; Consultant(Rater-2): 1-31, 2-12, 3-7 (Kappa 0.847 = 95% CI 0.701-0.991). There was a 96% agreement ( $\kappa = 1.00$ ) agreement between the clinic outcome and the final agreed triage outcome. 18 (2sf) clinic appointments could have been avoided by triaging.

**Conclusions:** We have demonstrated that triaging allows us to send patients straight to investigation thereby eliminating the need for a clinic appointment. The results obtained show that triaging can be done by a CNS as the strength of the inter-rater agreement is 'very good' and as a result we propose to implement this into our Colorectal Department.

### General 0114

#### Analysis of Metachronous Adenoma Sites Suggest Proximal Occurrence is More Probable

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**Aims:** A human sporadic colorectal adenoma may influence the formation of another adenoma even after its removal (up to 60% of patients develop metachronous adenomas following adenoma excision). However data regarding the occurrence site of a metachronous colorectal adenoma relative to the index adenoma is scarce. We investigated whether a metachronous colorectal adenoma was more likely to occur in the same, proximal or distal segment as the index adenoma.

**Methods:** A prospectively-maintained database was interrogated to identify all colonoscopies performed over a ten-year period at a single university teaching hospital. All patients undergoing polypectomy were cross-referenced against a histological database to confirm adenoma status. Patients with synchronous adenomas were excluded. The site of adenoma removal at index and subsequent colonoscopy was recorded and categorised into three groups (proximal, distal or same segment).

**Results:** 15,121 colonoscopies and 4759 polyp events were recorded. 361 patients developed a single metachronous adenoma at follow-up colonoscopy. Metachronous adenomas were more likely to develop in a different bowel segment (61%, 95% c.i. 56%-66%) to the index adenoma (39%, 95% c.i. 34%-44%;  $P < 0.01$  one way Chi-squared test). Metachronous adenomas were more likely to occur at a site proximal (41%, 95% c.i. 36%-46%) to the index adenoma than either the same segment (39%, 95% c.i. 34%-44%) or a more distal segment (20%, 95% c.i. 16%-24%;  $P < 0.01$  one way Chi-squared test). Proximally-sited metachronous adenomas were more likely to occur in a segment further away (mean [SD] segments travelled 3.5 [2.3]) from the index adenoma than distally-sited metachronous adenomas (2.6 [1.8] segments travelled;  $P < 0.01$  Kruskal-Wallis one way ANOVA).

**Conclusions:** A metachronous sporadic colorectal adenoma is more likely to be found in a section of the colorectum proximal to that of the index adenoma. Travel in segments may be significant. Taken together, the data suggest research effort into underlying mechanisms of metachronous adenoma is needed.

### General 0115

#### The Diagnostic Value of Performing Random Colonic Biopsies in Patients With Diarrhoea and Macroscopically Normal Colonic Mucosa

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**Aims:** To review the diagnostic yield from random colonic biopsies to investigate symptoms of diarrhoea in patients with macroscopically normal colonic mucosa.

**Methods:** Retrospective analysis from 01/10/2013 to 31/01/2014 for colonoscopy to investigate diarrhoea.

Patient notes, endoscopic and histopathology reports were accessed. The indications, macroscopic appearances, histology reports and long term outcomes were recorded. In cases where the indications were vague, or no indication recorded, clinical letters from the electronic patient record were reviewed to clarify the indication for colonoscopy prior to patient inclusion.

**Results:** 196 colonoscopies performed to investigate symptoms of diarrhoea 52% (n = 102) revealed macroscopically normal colonic mucosa. Of the 102 patients, 96% (n = 98) had random colonic biopsies. Of the 98 patients, 5.1% (n = 5) showed histological findings of microscopic colitis. 2 of the 5 received treatment

**Conclusions:** The Royal College of Pathologists (RCP) agree that when conducting a colonoscopy for chronic diarrhoea and macroscopically normal bowel mucosa, biopsies should be taken to detect microscopic colitis. However, unlike the JAG on GI Endoscopy, the RCP also states that with normal appearances of the mucosa biopsies should be taken only in the correct clinical setting. This setting is defined as persistent watery diarrhoea without blood, usually in a middle aged or elderly (often female) patient, with the expressed intention of confirming or refuting a diagnosis of microscopic colitis.

Restricting random colonic biopsies to patients with persistent diarrhoea without blood and setting a minimum age limit may be beneficial in increasing the diagnostic yield of random colonic biopsies. It may also have the added benefit of helping to reduce the costs associated with processing these biopsies.

### Audit and Outcomes Research 0137

#### Are we Recording Postoperative Complications Correctly? Comparison of NHS Hospital Episode Statistics With the American College of Surgeons National Surgical Quality Improvement Program

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**Aims:** Data obtained from hospital administrative databases in many health-care systems is used for clinical and non-clinical purposes by a wide variety of organisations with far-reaching effects. However, the accuracy and clinical utility of administrative data has been questioned and has generally been found to be inferior to data from clinical databases. We compare the recording accuracy of Hospital Episode Statistics (HES) data, an administrative database used in the National Health Service (NHS) with ACS NSQIP (American College of Surgeons National Surgical Quality Improvement Program), a well-established clinical database.

**Methods:** 1323 patient records from our hospital, common to both databases were compared for 10 surgical procedures (amputation, appendectomy,

cholecystectomy, femoral hernia repair, Hartmann's procedure, incisional hernia repair, inguinal hernia repair, long saphenous vein surgery, parathyroidectomy and umbilical hernia repair) and 9 postoperative complications (acute renal failure, myocardial infarction, pneumonia, pulmonary embolism, urinary tract infection, blood transfusion, septic shock, surgical site infection and wound disruption) using text strings or ICD-10 (International Classification of Diseases) codes. Kappa coefficient was calculated as a measure of concordance between HES and ACS NSQIP databases.

**Results:** The databases showed perfect or very good agreement in recording majority of surgical procedures (kappa coefficient range 0.82–1.0), but there was discordance in recording postoperative complications. When HES was investigated using text string or ICD-10 code, the kappa coefficient range for nine postoperative complications was 0.00–0.56, indicating poor to moderate interrater agreement. Concordance was even less when searched by HES coder's recommended way to record postoperative complications.

**Conclusions:** HES poorly registers postoperative complications. Suggested improvements include addition of dates when a postoperative complication is diagnosed to capture reliable 30 day morbidity data, nationally agreed criteria to identify postoperative complications, coding staff to receive specific training to identify postoperative complications, mechanisms to include postoperative events occurring outside hospital and consistent use of coding guidance.

## General 0186

### Factors Influencing Delayed Discharge After ERAS in Colorectal Surgery

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**Aims:** Enhanced recovery (ERAS) is now widely accepted as standard practice in colorectal surgery, however, one-third of patients do not achieve discharge within one week. This study aims to determine factors associated with delayed discharge, and hence failure of ERAS.

**Methods:** Prospective database-analysis of all patients undergoing a colorectal resection between November 2011 and January 2014 in a single institution on the ERAS pathway.

**Results:** Of the 314 patients, 280 (89.2%) underwent laparoscopic surgery, and compliance with key elements of ERAS was consistently above 90 percent. Nonetheless, 101 (32.2%) failed to achieve the ERAS goal of discharge within 7 days. In univariate analysis, increasing age (median 66 [22–92] vs 72 [16–93] years, < 0.001), ASA grade (ASA I 25.5%, ASA II 25.3%, ASA III 43.9%, ASA IV 54.5%, p=0.02), rectal resection (colon 25.6% vs rectum 41.1%, p=0.025), stoma formation (no stoma 23.8% vs stoma 50.0%, < 0.001), open surgery (laparoscopic 29.6% vs open 52.9%, p=0.006) and prolonged operating time (median 181.5 [43–537] vs 203 [70–469] minutes, p=0.019) were associated with ERAS failure. In multivariate analysis, age (OR 1.05 [1.025–1.074] per year), female gender (OR 2.00 [1.140–3.503]), operating time (OR 1.004 [1.0–1.007] per minute), open surgery (OR 3.55 [1.574–8.022]) and stoma formation (OR 3.311 [1.813–6.048]) were significantly associated with ERAS failure, but pre-operative stoma education did not positively affect the outcome.

**Conclusions:** Despite our high-volume laparoscopic approach and high rates of compliance with ERAS principles, not all patients achieve discharge within one week. More research should be directed to identify patients who may benefit from a more individualised ERAS care plan.

## General 0239

### Packing of Perianal Abscess Cavities (PPAC) Study: a Multi-Centre Observational Feasibility Study, Interim Analysis

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**Aims:** Acute perianal abscess is the seventh most common emergency general surgery condition (18,000 cases/year). This study investigates the current management and health outcomes with the aim of demonstrating feasibility for a randomised controlled trial of packing versus no packing.

**Methods:** Demographic and operative data was collected for all patients. Patients were asked to complete pain score diaries and QoL assessments using VAS and EQL-5D respectively, in addition to 1, 2, 3, 4, 8 week and 6 month follow up. This interim analysis was undertaken 11 months from study inception.

**Results:** 142 patients were recruited over 10 months at 15 centres. Mean age 39 years, 64% female.

At operation, 9% had a fistula identified (no fistulotomies) and 97% were packed. Average number of dressing changes in 21 days was 7.4.

Packing causes a double to three-fold increase in pain. Pain intensity halves after a week (table 1).

At 4 weeks, 48% healed. 8 week fistula rate was 21% and recurrence rate 9% (n=2) at 6 months. 26 patients withdrew consent or were lost to follow-up.

The estimated dressing and community nursing costs are £159.84 per patient, equating to £2,877,120 in England alone (18,000 patients per annum).

Table 1. Median (range) pain scores (Visual Analogue Score out of 100)

**Conclusions:** Packing is painful. A trial of packing versus no packing, based on pain scores, is feasible. If no packing is shown to be beneficial in terms of reduced pain and safe (no increased fistula or abscess recurrence rates), there could be considerable cost savings to the NHS and to patients, including reduced absence from work.

## General 0370

### Delays During General Surgical Operations can be Costly: Single Centre Audit and Measures to Reduce the Delay in Operation Room

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**Aims:** It is estimated that the cost of running a general surgical theatre is £14 –£20 per minute. Therefore, the delay in theatre may be associated with substantial financial implications. The objective of this study is to quantify the delay and highlight the causes of delay in running a general surgical theatre.

**Methods:** The "TIMEOUT" section of the WHO checklist was used as a standard. Delay of more than 5 minutes was recorded by operating surgeon (consultant and registrar). Any delay which occurred between "TIMEOUT" and "SIGNOUT" part of the WHO checklist was considered the delay. The delay record was collected on the pre-designed and approved proforma and later on data was transferred to electronic spreadsheet.

**Results:** The record of 55 consecutive CEPOD(29) and elective general surgical operations(26) over random two weeks period was collected and analysed. The delay was reported in 9 cases. In total 115 minutes of theatre time was wasted due to these delays. Five incidents of delays due to equipment failure longed 65 minutes; three incidents of delays due to non-availability of the equipment longed 30 minutes and one incident of delay of 20 minutes was due to absence of the senior surgeon at night. After the publication of results, the theatre staff as well as the surgeons were informed about these results, the causes of the delay were highlighted and they were educated about preventative measures. Second arm of the audit was completed on next 60 consecutive operations. Only two incidents of total delay of 16 minutes were recorded for those patients suggesting substantial change following the intervention.

**Conclusions:** Over 2 weeks period approximately 115 minutes were wasted by delays, costing the Trust approximately £53,040 per year. None of the delays resulting from equipment failures and equipment non-availability were predicted by the WHO checklist. Regular education of the theatre staff and surgeons can reduce these delays substantially.

## General 0396

### Efficacy of an Abscess Pathway

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**Aims:** Conventionally, patients with abscess admitted under surgery were operated according to the availability of emergency operation theatres. Other

emergencies prioritised, resulting unnecessary overnight stay and increasing cost burden on the NHS. Aim of the study was to assess efficacy of an already established abscess pathway.

**Methods:** An abscess pathway was utilised where patients were assessed and given appropriate preoperative instructions and then admitted the next morning to theatre admissions for Incision and Drainage (I & D) and discharged from theatre recovery. Case load database was extracted through theatre man records and cross referenced with retrospective admission lists.

**Results:** A retrospective review of a six month case load in a University Hospital equated to 152 cases. Male ratio was 55%. Majority were done under General anaesthetic in 148/152 (97%) versus Local 4/152 (3%), of which 145 (95.3%) went home directly from recovery whilst 7 required overnight observation or further management. 99/152 (65%) were ASA 1, 47/152 (31%) were ASA 2 and 9/152 (6%) ASA 3. Theatre slots was planned for the morning session to prevent prolonged fasting (with consideration to Emergency/trauma), hence 96/152 (63%) were induced before midday, 56/152 (37%) were induced before 17:00 and the remaining were all done before 20:00. Procedures were mainly performed by registrars. On average waiting times ranged between 1–14 hours (mean = 3.743 hours). Average length of stay of 152 patients after the introduction of abscess pathway was 3.743 hours (StD 1.66), 100% had the procedure done on the day of admission.

**Conclusions:** Abscess pathway decreased the hospital stay of medically fit patients after I&D, improving efficiency and cutting costs. This generally on average saved our trust ( $152 \times 350 = \pounds 53,200$ ) in 6 months. These patients were admitted to theatre admissions leading to release of acute surgical inpatient beds for managing other emergencies and electives.

## Education and Training 0402

### Outcomes After Colorectal Cancer Resection are Equivalent Between Consultant and Trainees - Results of a 10 Year Single Surgeon Series

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**Aims:** At a time of increasing scrutiny of individual surgeon outcomes, there are few studies on whether the process of training registrars in colorectal cancer resection has an adverse effect on outcomes. This study aimed to assess outcomes after colorectal cancer resection where the first operator was either a consultant surgeon or a trainee under consultant supervision.

**Methods:** Data were prospectively recorded in a single consultant surgeon database from 2004 to 2014. The primary endpoint was overall survival. Secondary endpoints were conversion to open, operative time, blood loss, anastomotic leak, general and surgical complications, length of stay, R1 resection status, lymph node harvest > 12 and local recurrence. All data were analysed using SPSS.

**Results:** Of a total of 361 resections, 226 were performed laparoscopically. The consultant was the primary operator in 259 cases, a trainee in 102 cases. Apart from a longer mean follow-up period in the consultant group (35 vs. 27 months,  $p=0.02$ ), both groups were evenly matched in terms of age, gender, ASA status and T stage. The median operative time was non-significantly longer for trainees (150 vs. 120 minutes,  $p=0.08$ ). Otherwise, there was no significant difference between the consultant and trainees in overall mean survival (93 vs. 75 months,  $p=0.18$ ), conversion to open (34 vs. 11,  $p=0.54$ ), median blood loss (100 vs. 100 ml,  $p=0.07$ ), anastomotic leak (21 vs. 3,  $p=0.10$ ), general complications (29 vs. 13,  $p=0.78$ ), surgical complications (36 vs. 9,  $p=0.15$ ), length of stay (7.0 vs. 7.5 days,  $p=0.21$ ), R1 resection status (18 vs. 8,  $p=0.58$ ), lymph node harvest > 12 (223 vs. 83,  $p=0.83$ ) and local recurrence (11 vs. 6,  $p=0.58$ ).

**Conclusions:** In selected cases, the training of registrars under consultant supervision does not have an adverse effect on outcomes after colorectal cancer resection.

## General 0503

### Tube Ileostomy as a Faecal Diversion for Elective Distal Colorectal Anastomoses - a Systematic Review and Pooled Analysis

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**Aims:** Loop ileostomy for faecal diversion in elective distal colorectal anastomosis, and its subsequent reversal, are associated with significant patient morbidity and rarely even mortality. Tube ileostomy, whereby a luminal tube is secured within the ileum and delivered through the anterior abdominal wall creating a temporary passage for intestinal effluent, may be an alternative technique. However its evidence base is not established as yet. This systematic review aimed to evaluate its usage and compare outcomes associated with it and the current established technique.

**Methods:** A systematic literature search of MEDLINE, Embase, Web of Science, and Cochrane database was conducted. The intraoperative technique, postoperative management and complications were assessed. Outcome measures included anastomotic leak, reoperation and stoma-related complications.

**Results:** Seven studies met the inclusion criteria. Three were case series consisting of 101 patients and four were non-randomised comparative studies consisting of 421 patients. Pooled analyses comparing tube ileostomy to loop ileostomy, revealed there were no significant differences in anastomotic leak rates [pooled Odds Ratio (OR) 0.64, 95% Confidence Interval (CI) 0.20–2.04] or stoma-related complication rates (pooled OR 0.62, 95% CI 0.04–8.87).

**Conclusions:** Tube ileostomy, although not a new surgical innovation, is being utilised more frequently in the elective setting in recent years. Pooled analyses of studies comparing tube ileostomy to loop ileostomy, do not show statistically significant differences in anastomotic leak or stoma-related complication rates. Further refinement of this technique and randomised controlled studies are however necessary to before this technique is routinely taken up by surgeons.

## General 0524

### Role of Prophylactic Antibiotics in Milligan Morgan Hemorrhoidectomy: a double blinded randomised Control Trial

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**Aims:** It had been advocated that prophylactic antibiotics in Milligan Morgan Hemorrhoidectomy resulted in better pain relief and quicker healing of the wound. This study was designed to evaluate the efficacy of prophylactic antibiotics, in terms of post op pain, post op consumption of analgesics and rate of wound healing in patients under going Milligan Morgan hemorrhoidectomy for Grade III and Grade IV hemorrhoids.

**Methods:** Patients undergoing Milligan Morgan hemorrhoidectomy for grade III and IV hemorrhoids were randomized in 2 groups by using computer generated table. Group A did not receive any prophylactic antibiotic whereas Group B received 500 mg I/V metronidazole and 1gm Ceftriaxone I/V before induction of anesthesia. All the patients had standardized post operative care. Pain scores on 100 mm Visual Analogue Scale and consumption of oral analgesics were noted from 1st to 7th post operative day. Time required for complete healing was also noted. Double blinding was ensured and the data was entered on SPSS and p value was calculated.

**Results:** Out of 120 patients 96 patients (47 in group A and 49 in group B) completed the study. Demographical data was comparable in both the groups. There was no difference in the pain scores ( $p > 0.5$ ), analgesic consumption ( $p > 0.5$ ) and rate of wound healing (Group A 4.89 weeks, Group B 4.76 weeks,  $p > 0.371$ ) between both the groups.

**Conclusions:** Prophylactic antibiotics have no effect in patients undergoing Milligan Morgan hemorrhoidectomy (grade III and IV hemorrhoids), in terms of decrease post operative pain, decrease post operative consumption of analgesics and faster rate of wound healing.

## General 0528

**Comparison of Electrocautery Incision with Scalpel Incision in Midline Abdominal Surgery - a Randomized Trial**

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**Aims:** To compare the electrocautery incision with scalpel incision in patients undergoing abdominal surgery using a midline incision with respect to incision time, blood loss during incision, postoperative incision site pain and wound infection.

**Methods:** Patients undergoing midline abdominal surgery were randomized into electrocautery and scalpel groups. The incision dimensions, incision time and blood loss during incision were noted intraoperatively. Postoperative pain and wound infection were recorded on every postoperative day for one week.

**Results:** 41 patients in each of the two groups were analyzed. Gender and age distribution was similar in both the groups. The mean incision time per unit wound area in the electrocautery group and scalpel group was  $9.40 \pm 3.37$  sec/cm<sup>2</sup> and  $9.07 \pm 3.40$  sec/cm<sup>2</sup> ( $p = 0.87$ ) respectively. The mean blood loss per unit wound area was significantly lower in the electrocautery group at  $6.46 \pm 3.94$  ml when compared to that of  $23.40 \pm 15.28$  ml in the scalpel group ( $p < 0.0001$ ,  $CI = 11.97 - 21.89$ ). There was no significant difference in pain on any of the postoperative days between the two groups and there was no significant difference in the wound infection rates between the electrocautery and scalpel groups (14.63% vs. 12.19%;  $p = 0.347$ ).

**Conclusions:** With a comparable Postoperative incision site pain, wound infection rate and significantly lower blood loss with the equal time taken for the incision, electrocautery can be considered safe and effective in making skin incision in midline laparotomy compared to scalpel incision.

## General 0568

**Does Patient's Postcode Determine When They Present With Gastrointestinal Cancer? Socioeconomic Status and the Initial Stage of Presentation**

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**Aims:** To assess the correlation between socioeconomic status (SES) and initial stage of hospital presentation in gastrointestinal (GI) cancer patients during economic recession.

**Methods:** A single centre, retrospective, observational study was completed. Initial radiological staging of operable GI cancers (Colorectal, Oesophageal & Gastric) between 01/01/2011 to 31/12/2013 from elective and emergency admissions were included from the CANISC database. Initial staging was performed using the 7th TNM classification via CT, MRI & EUS as per protocol. T3, T4, nodal positive and/or distant metastasis patients were considered as having a delayed presentation (DP). Carstairs' Score for social classification was identified by postcode searches from the Office of National Statistics and Credit Reporting Agency databases. Patients were classified into 'Affluent' (AF) (Carstairs' 1, 2 and 3) or 'Less Affluent' (LAF) (Carstairs' 4 & 5) groups. 'Z' test was used to calculate the p value and  $< 0.05$  was considered significant.

**Results:** A total of 541 (412 Colorectal, 77 Oesophageal & 52 Gastric cancer) patients were diagnosed with GI cancer of which 508 were included in the study. 291 (57.2%) belonged to the AF group & 217 (42.7%) to the LAF group. The DP group contained 236/508 (46.4%) patients of which 134 (56.7%) were AF & 102 (43.2%) LAF. The increased incidence of delayed presentation in the AF population group is noted to be statistically significant ( $p = 0.00318$ ). Whereas in the emergency presentations, there was no statistically significant difference, noted between the studied groups ( $p = 0.1936$ ).

**Conclusions:** A significant relationship between higher affluence and delayed presentation of GI cancers was noted, however, this may be attributed to various reasons including the lack of data on inoperable GI cancers. Reassuringly, there is no significant relationship between affluence and emergency presentations of GI cancers.

## General 0774

**Surgeon Specific Outcome Data in Colorectal Cancer Surgery - The Patient Perspective**

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*UHS*

**Aims:** NHS England requires trusts to report individual outcomes in ten clinical specialties. In September 2013, the Association of Coloproctology of Great Britain & Ireland (ACPGBI) published individual surgeon and hospital outcomes detailing 90-day mortality rates after elective resection for bowel cancer. This data is available to view online. Our aims were to investigate patients' awareness and perspective of surgeon specific outcome data and to find out what was important to them about their upcoming operation.

**Methods:** Over a 3 month period, all consecutive patients attending preoperative assessment prior to resection for colorectal cancer at a teaching hospital were asked to complete the survey.

**Results:** Of the 41 patients asked to complete the survey 40 (98%) responded. 9 of 40 (22.5%) patients stated they were aware of the surgeon specific outcome data and of those, 4 said they would know how to find it. 32 (80%) patients said the surgeon was more important than the hospital, 5 stated the hospital and 3 were undecided. When asked about other factors, 26 (65%) stated the reputation of the surgeon was the most important. Only 2 patients chose surgeon specific mortality rate, 9 said the number of times the operation had been performed and 3 did not answer the question.

**Conclusions:** Most patients undergoing surgery for bowel cancer are unaware of the published outcome data for their surgeon. Of those that are aware less than half would know how to find it. However the overwhelming most important factor for the patient is the perceived reputation of the surgeon.

## General 0782

**ERAS Outcome Pilot Study: Exercise Tolerance is the Only Modifiable Lifestyle Factor That Predicts Post-Operative Outcomes in an ERAS Population**E. McLennan<sup>1</sup>\*, R. Oliphant<sup>2</sup>, C. McCutcheon<sup>2</sup>, S. Moug<sup>2</sup><sup>1</sup>*School of Medicine, University of Glasgow,* <sup>2</sup>*Department of General Surgery, Royal Alexandra Hospital Paisley*

**Aims:** Enhanced recovery after surgery (ERAS) programmes aim to standardise peri-operative care to improve outcomes. Many variable patient-related factors can potentially adversely influence outcomes. However, it remains unclear as to the main patient-related determinants of adverse outcome in the setting of a colorectal ERAS programme. This study explores the influence of such factors on short-term outcomes after colorectal surgery.

**Methods:** Consecutive patients enrolled on an ERAS pathway after elective colorectal surgery at one hospital site from June 2013 to March 2014 were included. Prospectively collected data from an ERAS departmental database were linked to computerised hospital records that recorded lifestyle factors and analysed for their influence on post-operative complications and length of stay.

**Results:** A total of 138 patients (55.1% male) were included. The mean age was 61.4 years (s.d. 15.0). Forty nine (35.5%) were non-smokers, 6 (4.4%) reported hazardous alcohol intake, 78 (56.5%) were overweight or obese, 10 (7.2%) had a limited exercise tolerance (self-reported by patient as 'unable to climb 2 flights of stairs without stopping') and 66 (47.8%) had a Charlson Co-morbidity score of  $\geq 3$ . Forty six (33.3%) had a post-operative complication (Clavien-Dindo I-III). The mean length of stay was 7.8 days (s.d. 4.9). Patients with limited pre-operative exercise tolerance were associated with more than a 5-fold increased risk of post-operative complications (Clavien-Dindo I-III) (OR 5.1 (95% c.i. 1.24, 21.03;  $P = 0.024$ )) and were almost 3 times more likely to have prolonged hospital stay (OR 2.87 (95% c.i. 1.02, 9.80;  $P = 0.047$ )) compared to those with good exercise tolerance. Age, gender, deprivation, smoking status, alcohol intake, BMI or level of co-morbidity were found not to be significant.

**Conclusions:** Limited exercise tolerance was associated with increased post-operative complications and prolonged hospital stay, creating a potential role for prehabilitation in colorectal surgery.

## General 0795

**Magnetic Resonance Imaging in Assessment of Anorectal Fistulae; A Prospective Analysis**

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**Aims:** To determine the accuracy of STIR (Short Tau inversion recovery) MRI using surface body coils in patients with perianal fistulas, taking examination under anesthesia (EUA) as the gold standard.

**Methods:** One hundred and thirty consecutive patients with suspected perianal fistulas on clinical examination were followed prospectively over a period of 12 months. The sample size was calculated with 95% confidence level taking estimated percentage of accuracy of MRI to be 88% in determining the type of perianal fistula. All patients underwent pre op MRI using 1.5 T (Tesla) Toshiba MRI with phased-array surface coils. In addition to FSE (Fast Spin Echo) T1WI (weighted) and FSE T2WI sequences, STIR sequence was also used. The findings were noted and later compared with those at EUA.

**Results:** The mean age was  $42.34 \pm 4.21$  years. Ninety eight (75.38%) were male. On MRI 119 (91.54%) patients were found to have a perianal fistula irrespective of its type, while 11 (8.46%) patients were negative for a fistula. On the other hand after EUA 123 (94.62%) patients were confirmed to have a perianal fistula irrespective of its type while 7 (5.38%) patients didn't have a fistula ( $p=0.4645$ , OR = 0.6517, RR = 0.9675 with a 95% CI).

**Conclusions:** MRI should be the imaging technique of choice for preoperative evaluation of perianal fistulas as it provides a highly accurate, rapid, and noninvasive means of assessment.

## General 0916

**Study of the Effect of Previous Hysterectomy on Colonoscopy**

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**Aims:** There is much debate in the literature regarding the technical difficulty of performing colonoscopy in women with a history of pelvic surgery. Recent meta-analysis has highlighted the heterogeneity of previous studies, yet concluded that completion rates are lower in women with a previous hysterectomy. We conducted a study to assess whether previous hysterectomy resulted in a more difficult colonoscopy, as measured by amount of sedation required, patient discomfort, duration of procedure and caecal intubation rate.

**Methods:** Prospective data was collected on women who underwent colonoscopy between March 2013 and April 2014 at a district general hospital endoscopy unit. Patients completed a questionnaire about their past surgical history and information regarding demographics, comfort scores, duration of procedure and caecal intubation rate were obtained. Results for patients with and without a previous hysterectomy were compared using Pearson's chi squared analysis.

**Results:** 95 patients undergoing colonoscopy completed the questionnaire, demonstrating an average age of 60 years. 25 patients (26.3%) had a previous hysterectomy, showing no significant difference in mean duration of endoscopy (29.87 minutes 95% CI 22.37–34.59 vs 28.48 minutes 95% CI 27.01–32.73 with no previous surgery), comfort scores ( $p=0.632$ ), amount of sedation required (Midazolam  $p=0.238$ , Pethidine  $p=0.538$ ) or caecal intubation rate ( $p=0.354$ ) when compared with those who had no such past surgical history.

**Conclusions:** Colonoscopy was not found to have any difference in terms of technical difficulty in patients who had undergone a previous hysterectomy, as measured by patient discomfort, level of sedation, caecal intubation rate and duration of procedure.

## Emergency General Surgery

### General 0128

#### The Current Role of Ultrasonography in the Diagnosis of Acute Appendicitis.

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*Craigavon Area Hospital*

**Aims:** Acute appendicitis is a common cause of abdominal pain requiring admission to hospital. Imaging modalities have improved diagnostic accuracy in patients in whom the diagnosis is not apparent on the basis of history and clinical examination. This study aims to determine the sensitivity and specificity of US in diagnosing acute appendicitis in the setting of a large district general hospital.

**Methods:** We reviewed all US appendix examinations performed by a single consultant radiologist between April 2010 and March 2014. Data was collected from an online radiology reporting application on patient demographics, presenting history, US findings and follow up investigations. Histopathology results and the patient's diagnosis on discharge were obtained from a national electronic care record.

**Results:** A total of 498 US appendix examinations were identified for analysis. There were 348 (69.9%) females with a mean age of 22.8 years. Mean age in male patients was 19.8 years. A total of 136 (27.3%) patients had a positive US examination. Of these 114 patients had histologically proven appendicitis, 5 patients had pinworm infestation, 2 had pinworm and appendicitis and 9 patients had a histologically normal appendix. Six patients with a positive US appendix did not undergo appendicectomy. Five patients with negative US appendix had histologically proven appendicitis. The overall sensitivity of US in diagnosing acute appendicitis was 95.9% with a specificity of 94.7%. The positive predictive value of US was 85.3% with a negative predictive value of 98.6%.

**Conclusions:** US appendix is a highly sensitive and specific investigation in diagnosing acute appendicitis. It is particularly useful in patients in whom there is diagnostic uncertainty based on the clinical history, examination and blood investigations. Importantly, US avoids exposing, typically, young females of child bearing age to ionising radiation and therefore, has an important role in the management of this common surgical problem.

### Emergency Surgery including Trauma (ASGBI) 0261

#### Appendicectomy Pre and Post Introduction of a Dedicated Emergency Surgical Unit.

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*Royal Victoria Hospital*

**Aims:** The creation of Emergency Surgical Units (EmSU) throughout the world has changed how acute surgical admissions are managed. They have been shown to improve outcomes for patients. This study looked at one of the most common acute surgical presentations, acute appendicitis, and the amalgamation of acute surgical admissions from 3 sites across Belfast into one central site. We assessed numerous parameters both pre and post introduction of a new EmSU in 2013.

**Methods:** Retrospectively examined patients undergoing emergency appendicectomy in the EmSU [June - November 2013] compared to one year previous [June - November 2012]. In 2012 3 sites accepted acute surgical admissions; in 2013 all patients were referred to the EmSU. We obtained operative data from discharge letters, theatre management systems, histopathology and radiology reports.

**Results:** Significant improvements were identified in length of stay-78.5% discharged within 3 days as opposed to 65% in 2012. Significant reduction in operations performed out of hours (6pm - 8am), 46% in 2013 v 54% in 2012. A decrease in clinical diagnosis 65% vs 69% and an increase in the use of CT scan for diagnosis (31% vs 25%). There was also an increase in

the use of Laparoscopic Appendicectomy 25% vs 17%. Time from diagnosis to theatre remained similar with 88% of patients in both 2012 and 2013 undergoing appendicectomy within 12-14 hours. Average time from diagnosis to appendicectomy in 2012 was 6 hours 14 minutes and in 2013 was 6 hours 54 minutes.

**Conclusions:** Our results demonstrate no significant reduction in time from diagnosis to theatre however do show an improvement in pre-op imaging, use of laparoscopic surgery, length of stay and proportion of daytime operations. Our results are similar to other studies into new emergency surgery units demonstrating the positive impact that these units can have on outcomes for acute surgical admissions.

### Audit and Outcomes Research 0536

#### What is the Correct Prophylactic Dose of Tinzaparin in General Surgical Patients?

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*Warwick Hospital*

**Aims:** Thromboprophylaxis should be prescribed in accordance with risk of thrombosis. The manufacturers of Tinzaparin recommend 3500 units for prophylaxis of DVT in all general surgical patients. Orthopaedic patients are classified as high risk and should receive a weight based calculated dose of 50IU/kg body or 4500 units. Currently there is no consideration of tinzaparin dose for general surgical patients who are at high risk of thrombosis i.e. cancer patients or emergency surgery patients. Furthermore, there is no guidance for patients who are under or overweight.

**Methods:** A prospective audit was conducted over 8 weeks on one ward. All emergency and elective surgical patients were considered. Data collected included patients' demographics, weight and tinzaparin dose. This was compared to a theoretical weight calculated dose (TWCD).

**Results:** 100 general surgical patients were included. Median age 69 years (range 25-95). Median weight 74 Kg (range 41-100). 30% of patients underwent surgery and were considered high risk of DVT. 70% were managed conservatively and considered low risk. 13% of patients received 3500 units. 87% received 4500 units. 57% of general surgical patients received too high a dose of tinzaparin on risk criteria alone by 1000 units. The median TWCD was 3650 unit (range 2095-6487).

All high risk patients received the recommended 4500 units. The median TWCD was 3640 units (range 2750- 4800). Considering TWCD; 71.2% patients were over anti-coagulated by median 1109 units. 20.7% of overweight patients were under anti-coagulated by median 1560 units.

Four patients bled significantly post surgery. They received 4500 units. According to weight based calculations they were over anti-coagulated by a median of 638 units.

**Conclusions:** The correct dose of tinzaparin needs clarification in general surgical patients. We recommend consideration of a weight calculated dose of tinzaparin.

### General 0554

#### Systematic Review and Meta-Analysis of Outcome Following Trainee Versus Expert Performed Appendicectomy

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<sup>1</sup>Barnet General Hospital, <sup>2</sup>The Royal Marsden, London

**Aims:** Appendicectomy is one of the most commonly performed operations in general surgery, and is predominantly performed by surgical trainees. The aim of the present study was to compare the outcomes following trainee and expert performed appendicectomy.

**Methods:** Systematic literature searches identified studies until September 2014. Studies comparing outcomes following trainee and expert/consultant appendicectomy were included. The primary endpoint was the adverse event rate following appendicectomy. Secondary endpoints were length of operation, length of hospital stay, rate of complex findings at appendicectomy, rate of post-operative collection, wound infection and conversion to open surgery. A subgroup analysis comparing outcomes following laparoscopic surgery was conducted.

**Results:** 13 studies were included in the final analysis from which 37505 appendicectomies were performed, 23641 (63.0%) by trainees. 8 studies reported outcomes following laparoscopic appendicectomy only. The total adverse event rate was 12.0% across all groups. Overall, the trainee group had a lower rate of adverse events (10 studies, OR 0.73,  $p < 0.05$ ) and a lower rate of post-operative collection (OR 0.63,  $p < 0.01$ ) when compared with the expert group. There was no difference in rate of wound infection between the two groups. Trainees took slightly longer to perform appendicectomy compared with experts (7 studies; WMD 7.21,  $p < 0.05$ ). In the laparoscopic subgroup, there was no significant difference in adverse event rate between the two groups.

**Conclusions:** In selected cases, open and laparoscopic appendicectomy can be safely performed by trainee surgeons, with only a small increase in operation time. Trainees should continue to perform the majority of appendicectomies.

## Audit and Outcomes Research 0555

### Antibiotics Please! Audit of Antibiotics use in Acute Appendicitis

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Dorset County Hospital NHS Foundation Trust

**Aims:** Antibiotics have an important adjunctive role in managing appendicitis, however their use is often inappropriate and varied. This can lead to antibiotics resistance, morbidity and ultimately compromise patient safety. To help prevent indiscriminate use a variety of national guidelines have been developed. We aimed to audit antibiotic use in acute appendicitis against guidelines and change practice with a evidence-based trust-wide policy.

**Methods:** All patients undergoing appendicectomy over a two-month period (November-December 2013) were audited. Data were collected on antibiotic prescription before, during and after surgery and compared with guidelines. The duration of post-operative antibiotics was recorded and compared with operative findings to assess appropriateness. All morbidity within 30 days was observed. A locally agreed evidence-based antibiotic policy was introduced and re-audited using the same method (July-August 2014). Only complete data was included.

**Results:** In cycle one, 25 patients underwent appendicectomy. 22 (88%) patients received a pre/intra-operative antibiotic dose. 10 (40%) patients were prescribed post-operative antibiotics for a median 5 days (range 2–14). Only 3 (30%) prescriptions were appropriate.

Cycle two included 20 patients. Pre/intra-operative prescriptions improved to 18 (90%). 12 (60%) cases received post-operative antibiotics for a median 5 days (range 1–14). Appropriate prescriptions increased to 7 (53%). Post-operative complications were comparable between cycles; 12% versus 15% respectively.

**Conclusions:** The majority of pre/intra-operative prescriptions were consistent with guidelines however post-operative antibiotic use was inappropriate and varied. We demonstrated that through the use of a focussed prescription policy inappropriate prescriptions can be reduced without exposing patients to excess morbidity.

## Surgical Complications 0592

### Readmission Following Appendicectomy - is it Related to the Underlying Pathology?

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Royal Stoke University Hospital

**Aims:** Appendicectomy is the most commonly performed emergency general surgical procedure in the UK. Despite being seen as a simple procedure, the complication rate is around 10%. We sought to ascertain if those with histologically confirmed appendicitis were at risk of higher post-operative readmission.

**Methods:** Data were retrospectively obtained using theatre records for all appendicectomies performed in our trust between 1st September 2012 to 31st August 2014. Notes and electronic records were reviewed to obtain information on patient demographics, clinical features, operative procedure, histology and post-operative course. P-values were calculated using Fisher's exact test.

**Results:** A total of 824 patients underwent appendicectomy within the study period, of which 88 (11%) had unplanned post-operative readmission; of those, 85 (96%) were performed laparoscopically and 3 (3%) were lap-converted-to-open. The negative appendicectomy rate was 35% (31) within the readmitted patients, with a higher frequency in females (21, 42%) than in males (10, 26%).

On readmission 48 required antibiotics, 19 simply required analgesia, 17 had a further surgical procedure, 8 required wound management and 7 had an interventional drain placed.

Those who had histological appendicitis were more likely to require surgical or radiological intervention (33% v 10%,  $p = 0.019$ ) but less likely to only require pain management (15% v 36%,  $p = 0.032$ ). Overall there was no difference in the rate of wound infections (7% v 13%,  $p = 0.451$ ) or the need for post-operative antibiotics (58% v 45%,  $p = 0.268$ ).

**Conclusions:** Overall there was a high rate of readmission within those with a histologically normal appendix, but they were unlikely to require surgical intervention, and more likely to simply require analgesia. In this group, readmission in part is due to failure to identify the underlying cause on first admission rather than as a result of surgical complication.

## Audit and Outcomes Research 0640

### An Audit of Feeding Times in Paediatric Patients Undergoing Emergency Appendicectomy

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South Devon NHS Foundation Trust

**Aims:** Children, like adults, are required to fast before general anaesthesia to reduce the volume and acidity of stomach contents. Prolonged fasting can have significant physiological and psychological effects on children. Current guidelines suggest children should fast preoperatively for 6 and 2 hours with regard to food and clear fluids respectively (1). Control over operative and therefore fasting times for emergency surgery can be challenging. This audit aims to compare local practice to fasting guidelines with respect to paediatric emergency appendicectomy.

**Methods:** This audit is a retrospective review of children between 5–16 years of age undergoing emergency appendicectomy from November 2013 to April 2014 in our District General Hospital. A standard was set for fasting: 6–7 hours for food and 2–2.5 hours for clear fluids.

**Results:** 22 paediatric patients underwent emergency appendicectomy in the audit period. Patients ranged from 7–15 years, with an average age of 11 years. The average starvation for food was 12 hours 59 minutes, with 14% of patients reaching the target (6–7 hours). The average time for starvation for clear fluids was 9 hours 28 minutes, with 5% of patients reaching the target (2–2.5 hours). The average delay for starting IV fluids was 4 hours 24 minutes.

**Conclusions:** Patients were inappropriately starved pre-operatively. This is unlikely to be specific to our hospital and so should prompt a review of the delivery of emergency services. Both our general surgical and anaesthetic departments are currently looking into educating all members of the team regarding feeding times and the introduction of preoperative drinks.

(1). Cochrane Database Syst. Rev. 2009 Oct 7;(4). Preoperative fasting for preventing perioperative complications in children (Review). Brady MC, Kinn S, Ness V, O'Rourke, Randhawa N, Stuart P.

## Emergency Surgery including Trauma (ASGBI) 0643

### Right Iliac Fossa (RIF) Pain: How are These Patients Best Managed?

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**Aims:** Locally 900 patients/year are referred to the adult surgical take with RIF pain. 18.5% of total referrals went straight to theatre with a presumptive diagnosis of appendicitis within 24 hours. 14.9% patients were discharged without the need for imaging or theatre. For the other 66.6% there was some ambiguity in diagnosis that required further investigation or observation. We wanted to know which of these patients could be safely discharged, managed on an ambulatory pathway or taken to theatre?

**Methods:** In a large, single-centre University teaching hospital, data was collected prospectively on all patients referred to the adult ( $\geq 16$  years) general take with RIF pain, over a four month period. We looked at any imaging used and at the inflammatory markers (normal values WCC - 4–11, CRP - 0–7.5). Patients were followed up for 30 days.

**Results:** Data was collected on 303 patients over the study period. 80.6% patients with a raised WCC and CRP had a definite diagnosis due to an inflammatory process. Patients with a typical history and examination for appendicitis and raised inflammatory markers have a PPV of 73.9%.

Patients with an atypical history and examination for appendicitis and normal inflammatory markers have a NPV of 98.4%. The NPV of normal inflammatory markers combined with a normal USS or CT is 100%.

**Conclusions:** Patients who have one of typical history and examination raised inflammatory markers should be imaged and may be managed on an ambulatory pathway. Patients with normal inflammatory markers and normal USS are safe to be discharged without follow-up (NPV = 100%). Patients with a normal CT are safe to discharge without follow-up. Patients with a typical history and examination and raised inflammatory markers should have diagnostic laparoscopy rather than imaging.

## Emergency Surgery including Trauma (ASGBI) 0650

### Are The Outcomes of Patients Admitted with Right Iliac Fossa (RIF) Pain Affected by the Time of Day they Present?

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**Aims:** There is national focus on provision of emergency care and improving the outcomes of care provided out-of-hours. We have set up a specialist acute surgery unit with extended consultant hours on site in the evening and weekends (08:00–21:00 minimum) and a SpR at night. We looked at whether there was any significant difference in investigation, management and outcome for patients presenting with RIF pain during the in-hours and out-of-hours periods.

**Methods:** Data was collected prospectively on patients presenting with RIF pain to the adult ( $\geq 16$ ) surgical take over a 10 week period in a large, single-centre, University teaching hospital. In-hours was defined as Monday to Friday 08:00–19:59 and out-of-hours as Monday to Friday 20:00–07:59 and Saturday to Sunday. Admission time was taken on their arrival to the acute surgical unit.

**Results:** 193 consecutive patients were seen during the study period. There was no difference in the baseline characteristics of the two groups. There was no significant difference between the two groups in time to be clerked, time to have a senior review (SpR or Consultant), time to differential diagnosis or in length of stay. Patients who presented out-of-hours had a significantly shorter time to theatre (when required).

**Conclusions:** Patients get to theatre quicker out-of-hours due to a change in pressures on our CEPOD list. It is reassuring that there is no deterioration in the service given to or the outcomes of patients who present out-of-hours. This study shows the quality of out-of-hours emergency admission care can match that of in-hours care with small changes to working routine.

## Emergency Surgery including Trauma (ASGBI) 0653

### Development of a Model to Predict a Normal Appendix at Laparoscopy for Right Iliac Fossa Pain

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Doncaster Royal Infirmary

**Aims:** Despite the availability of imaging and haematological investigations there remains a moderate rate of negative appendicectomy, with associated morbidity. Current predictive tests and models are designed to identify which patients with right iliac fossa pain have appendicitis. We set out to develop a model to identify patients who are likely to have a normal appendix in the context of right iliac fossa pain.

**Methods:** As part of audit we identified 467 consecutive laparoscopic appendicectomies. Complete demographic data, haematology and biochemical test results were available for 258 of these. Variables were analysed using multivariate analysis and a binomial logistic regression model was derived. This model was validated on an independent set of 58 laparoscopic appendicectomies.

**Results:** Multivariate analysis confirmed age (OR 0.95), white cell count (OR 0.83) and bilirubin (0.94) as significant predictors of a normal appendix. Pseudo  $r^2$  was 0.28. Probability of normal appendix histology was calculated as a percentage and a ROC curve was plotted, showing good discrimination (AUC=0.85). The optimum cut off was at 51% probability of a normal appendix. These findings were confirmed in the validation group where the cut-off showed sensitivity and specificity of 0.84 and 0.86 respectively.

**Conclusions:** This model has potential to identify patients where the appendix might be left in situ and should be further evaluated in the clinical setting is associated with significant postoperative morbidity and longer hospital stay.

## Audit and Outcomes Research 0714

### The Use of a Dedicated Ambulatory Care Pathway as an Alternative to Admission for the Assessment of Patients Presenting with Right Iliac Fossa Pain

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**Aims:** We introduced a specific pathway for the assessment of patients presenting with right iliac fossa (RIF) pain. This pathway utilised the Ambulatory Care Unit (ACU) and was intended as a safe alternative to admission for suitable patients. We analysed the first 6 months to determine whether it was being used safely and appropriately, and furthermore, whether it conferred any measurable service improvements.

**Methods:** We retrospectively compiled a dataset for all patients using the RIF pain ACU pathway during a six month period from September 2013. Hospital IT systems were used to gather information on compliance with pathway criteria and patient outcomes. To determine the overall impact of the pathway, patients were compared with a matched group presenting in the six months prior to its introduction.

**Results:** 41 patients used the pathway, M:F = 10:31, mean age 29 years. 37 patients (90.2%) were reviewed by a Consultant within 24 hours of initial emergency department assessment. 24 patients (58.5%) were discharged without need for admission. 17 patients (41.5%) were admitted following consultant review; 12 (29.3%) going on to have a diagnostic laparoscopy +/- appendicectomy with 3 (7.3%) found to have histologically confirmed appendicitis.

In the preceding six months 37 patients were admitted that would have met criteria for ACU review. Outcomes were similar with 9 patients (24.3%) undergoing diagnostic laparoscopy +/- appendicectomy, and one patient (2.7%) having histologically confirmed appendicitis. Despite this, mean length of stay was higher at 2.1 days compared to 0.9 days for the ACU group.

**Conclusions:** The ACU is an appropriate setting for the assessment of these low risk patients that would traditionally be admitted for consultant review. Introduction of such a pathway could reduce overall numbers of admissions and shorten length of stay. Relaxation of stringent criteria for use of the pathway may help to improve the modest patient numbers.

## Emergency Surgery including Trauma (ASGBI) 0727

### A Review of Contemporary Radiological Imaging Utilisation Prior to Appendicectomy

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North Middlesex University Hospital NHS Trust

**Aims:** A patient management pathway guidance for patients with suspected acute appendicitis from the Royal College of Surgeons encourages routine imaging for female, obese, older age group patients and those with atypical presentation. Our study aimed to compare our departmental use of radiological investigation for patients undergoing emergency appendicectomy with this guidance.

**Methods:** Retrospective study of patients undergoing emergency appendicectomy from 16/10/2013–15/10/2014 in our Hospital. Admission Ultrasound Scan (US), CT and histological findings were collated.

**Results:** 328 emergency appendicectomies were identified, 144 females. Age range 4–82, median 28. There were 240 histologically confirmed acute appendicitis cases, no inflammation in 60 cases (18% negative appendicectomy rate), other pathology in 22 cases including 6 neoplastic, no lab histology available in 6 cases. US was used in 84 cases and CT in 92 cases, 8 patients underwent both. Only 33/84 cases suggested likely or possible appendicitis on US, 19/33 were histologically confirmed. In 51 cases US was unable to exclude, or reported unlikely appendicitis, 30/51 were histologically proven. 80/92 CT scans suggested acute appendicitis, histology confirmed in 71/80, 6/80 no inflammation, 1/80 carcinoid tumour, 2 no histology available. Of 12/92 CT scans not suggesting acute appendicitis 6 cases confirmed acute appendicitis on histology. 53/144 of females did not have any pre operative imaging, 33/53 had histologically confirmed acute appendicitis.

59/93 patients aged over 40 had CT, 35/44 patients aged over 50 had CT.

**Conclusions:** Our negative appendicectomy rate is comparable with nationally reported rates. A significant number of female and older age group patients did not undergo radiological imaging prior to appendicectomy, against Royal College guidance.

Confirmed histological appendicitis was apparent in in 60% and 50% of patients following non suggestive US and CT respectively. This highlights the importance of surgeons not relying solely on imaging findings in management of this presentation.

## Emergency Surgery including Trauma (ASGBI) 0732

### An Evaluation of the use of Inflammatory Markers in Patients Undergoing Emergency Appendicectomy

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North Middlesex University Hospital NHS Trust

**Aims:** Royal College of Surgeons guidance advocates routinely measuring C Reactive Protein (CRP) and White Cell Count (WCC) in patients with suspected acute appendicitis. A rise in both reportedly offers > 95% sensitivity for the diagnosis. Our study aimed to evaluate our unit's admission inflammatory marker use and correlate with histological findings.

**Methods:** A retrospective study of all patients undergoing emergency appendicectomy from 16/10/2013 until 15/10/2014 in our hospital. Admission WCC, CRP and histological findings were collated.

**Results:** 328 emergency appendicectomies were identified, 144 females. 69 were under 16.

There were 240 histologically confirmed cases of acute appendicitis, no inflammation in 60 cases (18% negative appendicectomy rate), other pathology in 22 cases including 6 neoplastic, no lab histology available in 6 cases. A CRP test was completed in 321 cases and WCC in 326. 145 adults had CRP > 5 and WCC > 10. Histological findings revealed 18 normal appendices, 11 other pathologies including 3 neoplasms with no histology available for 3 patients. This conveyed a sensitivity of 92.6% (95% CI 86.5–96.6%), specificity of 17.1% (95% CI 6.61–33.7%) and positive predictive value of 79.6% (95% CI 72.0–85.9%) for the diagnosis of acute appendicitis.

21 children under 16 with WCC > 15 and CRP > 5 underwent appendicectomy, 20 had histologically confirmed acute appendicitis. This conveyed a Sensitivity 83.3% (95% CI 62.6–95.2%) Specificity 50.0% (95% CI 8.17–91.8%) and Positive predictive value 95.2% (95% CI 76.1–99.2%).

4.6% (11/240) cases of histologically proven appendicitis had admission CRP < 5 and WCC < 10.

**Conclusions:** Investigation for suspected acute appendicitis included both CRP and WCC almost ubiquitously. Our data confirms a high level of sensitivity for the diagnosis of acute appendicitis, although this was lower in children.

Surgeons should consider the whole clinical context as acute appendicitis can still present with admission inflammatory markers within the normal range.

## Audit and Outcomes Research 0738

### Reducing Hospital Stay for Appendicectomies: a Retrospective Analysis of Laparoscopic Appendicectomies at Croydon University Hospital

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Croydon University Hospital

**Aims:** The gold standard for treatment for acute appendicitis is laparoscopic appendicectomy with the attendant advantages of reduced post-operative pain and rapid return to normal function through shorter expected post-operative hospital stay. There is also evidence that selected cases of acute appendicitis can be managed in an ambulatory setting with planned acute laparoscopic surgery and enhanced discharge similar to day case procedures. This retrospective study examined the potential for managing appendicitis as a day case emergency procedure and assessed the safety of early discharge following laparoscopic appendicectomy.

**Methods:** All appendicectomies performed at Croydon University Hospital between March and August 2014 were identified and the notes examined. Recently published criteria for patients suitable for early discharge following laparoscopic appendicectomy were used to identify patients suitable for enhanced management. Variables included severity of appendicitis; peri-operative observations; analgesia and anti-emetics required; urinary retention, independent mobilisation, orientation and self-caring in the peri-operative period. An analysis was performed of patients suitable for enhanced management with a cost-analysis included in our study. We also propose a management algorithm for treating patients with appendicitis on an ambulatory basis.

**Results:** A total of 87 patients undergoing appendicectomy were identified (median age 27 years old; 46% females, 54% males). Forty one (47%) patients were eligible for the proposed protocol. Reasons for exclusion were varied: 25 appendices were perforated/gangrenous, 17 were under 16 years of age and 3 were for delayed diagnosis, pulmonary embolus and urinary retention. In our cost-analysis, potential savings of £24,480 were identified through reduced hospital stay of approximately 92 days across all 41 patients in the peri and post-operative periods.

**Conclusions:** The introduction of an ambulatory pathway would reduce hospital stay following appendicectomy with attendant reduction in costs to the hospital. We also discuss a proposed algorithm for the management of patients with suspected acute appendicitis.

## General 0821

### Surgical Outcomes Of Appendicectomy In HIV-Infected Patients

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**Aims:** The Human Immunodeficiency Virus (HIV) pandemic has added a new dimension to the management and outcomes of many surgical conditions. The aim of this study is to describe and compare the outcomes of appendicectomy in HIV-infected (HIV+) and HIV-negative (HIV-) patients.

**Methods:** This is a prospective cohort study of patients undergoing appendicectomy at a large regional hospital from March 2010 to March 2011. Demographic data, duration of pre-hospital symptoms, HIV status, surgical approach, operative findings, histopathology reports, hospital stay and complications were recorded. Differences between the HIV+ and HIV- patients were then described, analysed and compared.

**Results:** The study group comprised 134 patients; 18 (13.4 per cent) tested positive for HIV. HIV+ patients were significantly older (mean age of 29.3 vs. 20.3 years, P=0.002) and had longer duration of pre-hospital symptoms (mean of 3.94 vs. 2.57 days, P=0.03). Postoperative complications (44.4 per cent vs. 17.2 per cent, P=0.03) and lengthier hospital stays (7.28 days vs. 5.95 days, P=0.004) were also more frequently seen in the HIV+ patients, when compared to their seronegative counterparts. There were no differences in appendiceal rupture rates, histopathological findings and mortality.

**Conclusions:** HIV infection is common in patients admitted with clinical features of acute appendicitis in South Africa. Presentation in HIV+ patients is delayed and surgery is associated with significant postoperative morbidity and longer hospital stay.

## Audit and Outcomes Research 0832

### Laparoscopic Appendectomy in Complicated Appendicitis - is it Evidence Based Practice?

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**Aims:** Laparoscopic appendectomy has been widely practiced for uncomplicated appendicitis. Complicated appendicitis is traditionally treated by open appendectomy and the role of laparoscopy in this situation is not fully recognized. Complicated appendicitis (CA) occurs once the appendix has become gangrenous and/or has perforated with various degrees of peritonitis. The aim of the audit is to see rate of intra-abdominal collection in complicated appendicitis when treated by laparoscopic technique in our hospital. This audit was initiated due to a complaint by a patient where laparoscopic approach was questioned in treating his perforated appendix.

**Methods:** The data on all patients who had complicated appendicitis (perforated, with abscess or free pus) and treated by laparoscopic procedure between the years 2005 to 2014 were collected retrospectively through hospital coding system. All the patients were traced through electronic radiology system to look for evidence of post-operative intra-abdominal collection.

**Results:** 109 patients were included in the study. 12 patients had perforated appendix, 15 had appendicitis with abscess and 85 patients had free pus in peritoneal cavity. 9 (8%) patients had post-operative imaging (USS/CT) for suspected intra-abdominal collection. 4 patients had imaging during the same admission and 5 on re-admission to hospital. 4 (3.6%) patients showed intra-abdominal collection. Only 1 patient (0.9%) required percutaneous drainage and remaining 3 patients were treated successfully with antibiotics only. None of the patients required surgical intervention. Re-admission rate was 4.5% and average hospital stay was 4.5 days following re-admission. There was no mortality in the current series.

**Conclusions:** Results were compared with the evidence in the literature where the incidence of intra-abdominal collection in complicated appendicitis following laparoscopic approach (LA) ranged from 5.7% to 8.2% and 4.3% to 22.9% in open approach (OA). We have found Laparoscopic approach in our institution a safe and effective technique in treating complicated appendicitis.

## General 0950

### Laparoscopic Appendectomy in Appendicular Mass. Is it A Safe Option?

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*Ain Shams University*

**Aims:** The aim of our study is to assess the safety of laparoscopic appendectomy in treatment of appendicular mass.

**Methods:** Our study is a prospective study which included 20 patients who underwent laparoscopic appendectomy between January 2012 and December 2012, the patients were operated upon in Ain Shams University hospitals. All patients had a confirmed radiological diagnosis of appendicular mass with out abscess formation preoperatively. they underwent laparoscopic appendectomy and we recorded the intraoperative complications, duration of operation, hospital stay and post operative complications.

**Results:** This study included 20 patients, 15 males (75%), 5 females (5%), The patients age ranged from 15 to 50 years. The mean operative time was 64-/+16.37 SD minutes, only one patient was converted to open because there was caecal ischemia and required caecal resection And his tissue biopsy showed caecal carcinoma intraoperative findings included 10 (50%) patients with appendicular mass without perforation. Caecal perforation 1 patient (5%), localized perforation with abscess formation 5 patients (25%), necrotic appendix with viable base 4 patients (20%). No intraoperative complications was recorded, the mean hospital stay was 64-/+20 hours. Only 4 patients developed wound infection at the umbilical port site. no other post-operative operations were recorded. We didn't record any mortalities.

**Conclusions:** Laparoscopic appendectomy for appendicular mass is a safe procedure and not associated with increased mortality or morbidity As long as the surgeon is experienced and familiar with the procedure.

## General 0957

### Non-Gallstone Causes of Right Upper Quadrant Pain in Women are Likely to be Insignificant

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*Royal Derby Hospital*

**Aims:** Right upper quadrant (RUQ) pain in women is a frequent reason for presentation to a surgical assessment unit (SAU). The aim of this study was to determine the cause of RUQ pain in those without gallstones.

**Methods:** Females referred to SAU in a teaching hospital with RUQ pain as a presenting symptom were identified from discharge coding during a six month period (Jan-Jun 2014). Final diagnosis was identified from electronic records.

**Results:** 206 female patients (median age 45.9 years, range 17-93) were identified. 78 were found to have RUQ pain but no gallstones. Diagnoses were pancreatitis (11.5%), gastritis (9.0%) and nonspecific abdominal pain (NSAP) (n = 29 (37.2%)). Half of patients with NSAP had CXR/AXR, all of which were normal, four patients underwent CT scan with no pathology demonstrated. A total of 43 bed days were used to investigate these 29 patients.

**Conclusions:** An ultrasound and simple blood tests including serum amylase can exclude causes of RUQ pain likely to require intervention. Our current practice over investigates patients and is inefficient in use of inpatient beds and other resources. A one stop assessment with access to bloods and ultrasound has now been introduced in our unit.

## Trauma & Emergency Surgery Critical Care (ASGBIATMS)

### Audit and Outcomes Research 0038

#### Age Alone Should not Preclude Surgery: Clinical Outcomes Following Major Emergency General Surgical Procedures in Nonagenarians- a 5-Year Experience

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*James Paget University Hospital*

**Aims:** Advanced age plays a major role in surgical risk assessment algorithms; however, the outcomes data for the very elderly are lacking. Also risk prediction tools tend not to focus precisely on the very elderly population such as nonagenarians (age > 90 years). We, therefore, evaluated the outcomes after major emergency general surgical procedures in nonagenarians at our institution during a 5-year period.

**Methods:** The patient demographics, procedural details, predicted mortality and morbidity as calculated by P-POSSUM (Physiological and Operative Severity Score for the enUmeration of Mortality and Morbidity) risk prediction scores and observed mortality were retrospectively analyzed.

**Results:** 44 nonagenarians underwent major operative surgery. Their median age was 92 yrs [interquartile range (IQR): 91–94]. Median hospital stay was 13.5 days (IQR: 7–22). Median post-operative hospital stay was 10 days (IQR: 5–18). 85% of the patients had ASA (American Society of Anesthesiologists) score  $\geq 3$ . 72% (n = 32) patients underwent laparotomy and additional procedure/s performed. Remaining patients predominantly had incarcerated/strangulated hernias (inguinal/femoral) repaired and did not require laparotomy per se. P-POSSUM predicted mortality was 1% (IQR: 0.43–2.09) and morbidity was 17% (IQR: 8.07–28.49%). Observed all-cause 30-day mortality was 11.36% (n = 5) and 60-day mortality was 15.9% (n = 7).

**Conclusions:** Acceptable outcomes can be achieved in very elderly patients undergoing major general surgery operations despite having significant co-morbidities and a high ASA score. With careful patient selection and further improvements in the peri- and post-operative patient care, even better outcomes can be expected. Age alone should not preclude surgery. A difference between P-POSSUM predicted and observed mortality has been observed. Refinement of P-POSSUM (and other similar risk prediction tools) is warranted since these risk-prediction tools tend to give same weighting to any patient with age above 70 yrs, although there is considerable variation in the physiological reserve with every passing decade in such an elderly population.

### Emergency Surgery including Trauma (ASGBI) 0111

#### Effect of Whole-Body Computed Tomography on Mortality in Trauma Patients: a Systematic Review

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**Aims:** The initial diagnostic evaluation and management of trauma patients is mainly based on Advanced Trauma Life Support (ATLS) guidelines worldwide. Based on ATLS principles, conventional diagnostics such as conventional radiography and focused abdominal sonography in trauma should precede selective use of computed tomography (CT). Whole-body CT (WBCT) is highly accurate and allows detection of life threatening injuries with good sensitivity and specificity. WBCT is faster than conventional diagnostics and saves more time in management of trauma patients. This study aims to review studies investigating the effect of WBCT on mortality in trauma patients.

**Methods:** In accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement standards, we performed a systematic review. We searched the National Library of Medicine's Medline database using a web-based search engine (PubMed) from 1946 to Jan 2014 to identify randomised and non-randomised studies evaluating WBCT in trauma patients with mortality as outcome of interest. Scottish Intercollegiate

Guidelines Network notes on methodology were used to assess the methodological quality of the selected studies. Statistical analysis of outcomes included odds ratio analysis, Trauma and injury-severity score (TRISS)-based standardised mortality ratio (SMR) analysis and Revised Injury Severity Classification (RISC)-based SMR analysis.

**Results:** Nine observational cohort studies reporting total of 34,468 patients were selected for analysis. WBCT in blunt trauma patients was associated with significantly lower overall mortality [OR = 0.69 (95% CI 0.56–0.84), P = 0.0003]. According to TRISS-based SMR and RISC-based SMR analyses, WBCT was associated with increased probability of survival [Pooled TRISS-SMR = 0.80 (95% CI 0.74–0.87), < 0.0001 and Pooled RISC-SMR = 0.85 (95% CI 0.81–0.89), < 0.0001].

**Conclusions:** Unlike previous systematic reviews, our study indicates that use of WBCT in blunt trauma patients is associated with reduced overall mortality and may improve the probability of survival. High quality randomised control trials are required to describe a causal relationship between WBCT and mortality.

### Emergency Surgery including Trauma (ASGBI) 0159

#### Measurement Of Adherence to Sepsis Guidelines in Emergency General Surgery Admissions: a Multicentre Study

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*SPARCS and the National Surgical Research Collaborative*

**Aims:** The aim of this audit was ascertain compliance with the sepsis six guidelines in acute general surgical admissions.

**Methods:** Audit standard. Adherence to the following standards within one hour of diagnosis was investigated: High flow oxygen (15 litres per minute). Blood cultures prior to antibiotic administration. Empirical broad-spectrum antibiotics. Fluid resuscitation (fluid challenges in divided boluses of 500mls/hour up to a total volume of 30mls/kg). Measurement of serum lactate and full blood count. Accurate urine output measurement (may require catheterisation). This was a prospective, protocol driven, multi-centre trainee led audit. Data was extracted on all patients presenting as emergencies within seven day period (21/10/13 to 28/10/13). All patients meeting diagnostic criteria for sepsis, as defined by the surviving sepsis campaign, within the first 24 hours following admission were further investigated using paper and electronic records to determine adherence to the surviving sepsis guidelines.

**Results:** 97 hospitals in five countries participated in this audit, with 5078 patients admitted as general surgical emergencies during the study period. In total 895 (17.6%) patients (141 male, median age 67.7 years) met the diagnostic criteria for sepsis with 282 (5.6%) presenting with severe sepsis. Adherence with the Sepsis Six Bundle was poor with less than a third of patients treated in compliance with four of the six guidelines.

**Conclusions:** This multi-centre audit has demonstrated that sepsis amongst emergency general surgical patients is common. Worryingly however the majority of patients admitted with sepsis are not receiving basic interventions proposed by the surviving sepsis campaign.

### Audit and Outcomes Research 0203

#### Patients' Experience of Emergency Surgery: Factors Associated With Increased Satisfaction

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**Aims:** There is a growing recognition of the importance of patient experience in healthcare, however little is known in the context of emergency intra-abdominal surgery. This study sought to quantify the association between

patient experience and overall satisfaction while controlling for clinical outcome measures.

**Methods:** The patient demographics, operation details and 30-day clinical outcome data of every patient who underwent emergency intra-abdominal surgery at a large teaching hospital were collected. Ethical approval was obtained to administer validated Patient Reported Experience Measures (PREMs) questionnaires either by telephone shortly after discharge or in person at the time of discharge. Categorical data was tested using Spearman's Rho test. Multiple regression analysis was performed for factors significantly associated with satisfaction in univariate analysis.

**Results:** Of 97 patients, 68 completed the questionnaire (70.1%). Overall satisfaction was high with 87% giving an overall satisfaction score of 7/10 or higher. In a well fitting multivariable analysis ( $R^2 = 0.78$ ), variables significantly associated with a higher overall satisfaction score were absence of night-time noise ( $\hat{\beta}^2 = 1.35$ , 95% CI 0.35–2.35,  $p < 0.0001$ ), clear responses to patient questions ( $\hat{\beta}^2 = 2.65$ , 95% CI 0.17–5.14,  $p < 0.01$ ), adequate treatment information ( $\hat{\beta}^2 = 1.49$ , 95% CI 0.19–2.78,  $p < 0.05$ ), involvement in discharge planning ( $\hat{\beta}^2 = 0.77$ , 95% CI 0.16–1.37,  $p < 0.05$ ), and provision of written information on discharge ( $\hat{\beta}^2 = 0.95$ , 95% CI 0.12–1.79,  $p < 0.05$ ).

**Conclusions:** Provision of good quality information during inpatient stay and on discharge is crucial to patient satisfaction. Improving the ward environment, particularly at night, can be challenging, but reducing noise may also improve the overall experience in emergency surgery.

## Emergency Surgery including Trauma (ASGBI) 0276

### Access to Emergency and Essential Surgical Care in Low and Middle Income Countries: A Systematic Review of Situational Analyses

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**Aims:** More than two billion people worldwide lack sufficient access to surgical care. A severe global disparity in the distribution of surgical provision exists. Improvements in surgical access and quality are required for the 2015 UN Millennium Development goals to be met. This study reviewed healthcare workforce, capacity, and infrastructure for the provision of emergency and essential surgical care in Low and Middle-Income Countries.

**Methods:** A systematic literature review using Embase and PubMed databases was performed in accordance with the PRISMA guidelines. Included studies reported either the WHO tool for Situational Analysis to Assess Emergency and Essential Surgical Care; Surgeons Overseas Personnel, Infrastructure, Procedures, Equipment and Supplies (PIPES) tool or the Harvard Humanitarian Initiative (HHI) tool.

**Results:** Data extracted from 25 studies (18 African, 3 South and Central American, 3 Asian and 1 Oceania), totalling 17 different countries and 591 health facilities. The number of qualified surgeons, obstetrician/gynaecologists and anaesthetists per 10,000 population ranged from 0.007–1.72, 0–1.25 and 0–0.48, respectively. Where provided, patients travelled mean 63 Km (range 30–119 Km) for surgical care. An average of 54% of surgical healthcare facilities had running water; 50% had electricity; 41% had a functioning anaesthetic machine, 39% pulse oximetry and 30% oxygen supplies. 85% of facilities could provide incision and drainage of an abscess; 70% c-section and 68% appendectomy. Only 68% offered closed treatment of fracture and 57% could undertake laparotomy.

**Conclusions:** This study is the first to review situational analyses reporting access to surgical care, highlighting key areas where availability is currently deficient. Adequate surgical provision is lacking in many Low and Middle Income Countries, further underlining the necessity of increasing surgical access in the drive towards improved global health. Future work should seek to focus on the development and provision of resources, both human and physical, to these areas.

## Audit and Outcomes Research 0290

### We are Shocking at Prescribing IV Fluids!

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**Aims:** Optimum intravenous (IV) fluid administration is important as excess, inadequate or wrong electrolytes can increase risk of death in 30 days post-operation according to the National Confidential Enquiry into Patient Outcome and Death (NCPED). The National Institute for Health and Care Excellence (NICE) published the first IV fluid guideline in December 2013. This audit demonstrates the severity of the problem with IV fluid prescription. This audit aimed to compare current IV fluid prescribing practice in our Trust with recent NICE guidelines for IV fluid therapy. Ultimately we aimed to establish local guidelines for IV fluid prescription.

**Methods:** Three months after the NICE guidelines we audited the IV fluid prescription for patients in surgical wards. All eligible patients had their IV fluid status recorded over a 24 hour period including type and volume of fluid administered. Patient weight was also recorded in order to calculate recommended electrolyte and fluid requirements. Actual fluid and electrolyte intake was then compared to national guidance. Patients with major co-morbidities were excluded.

**Results:** A total of 58 patients were found to be eligible for inclusion. Overall 97% of patients were found to have been prescribed inappropriate IV fluid regimens. In particular, 83% of patients received excess Na<sup>+</sup> (median excess 78% ± 10%) and Cl<sup>-</sup> (median excess 76% ± 18%), whilst 90% of patients did not receive enough K<sup>+</sup> (median deficiency 86% ± 29%) based on recommended daily requirements. However, 70% of patients received at least the recommended fluid volume over the 24 hour period.

**Conclusions:** A lack of excess administration of IV fluids and electrolytes has impact on mortality and morbidity of patients. We are prescribing excess sodium and chloride and lack potassium in our prescriptions. Patients are often complex and have different medical backgrounds that necessitate a full assessment of the patient before prescribing any regime of fluids.

## Audit and Outcomes Research 0343

### Just Give two Units: Audit of Inappropriate and Unnecessary Blood Transfusions in Emergency and Elective Surgical Patients

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Walsall Manor Hospital

**Aims:** Significant numbers of patients receive blood transfusions that are not indicated, needlessly exposing them to potentially life-threatening complications. The Serious Hazards of Transfusion (SHOT) Report shows that many of these are caused by error, and that errors are more likely if the transfusion is undertaken out of hours. The aim of this audit was to establish the number of surgical patients receiving blood transfusions that would be deemed inappropriate, and their timing.

**Methods:** A prospective audit of all elective and emergency patients on three general surgery and urology wards receiving unplanned blood transfusion during December 2013. Practice was measured against SHOT guidelines; red cell transfusion indicated when Haemoglobin (Hb) < 7 g/dl and that for an otherwise stable adult, 1 unit should be transfused and the clinical situation and Hb concentration re-assessed. A teaching session was undertaken and posters detailing the guidelines were placed on the wards and re-audit was completed in December 2014.

**Results:** The initial audit identified fourteen patients. Eight received appropriate transfusions, however no patients were managed as per the guidelines. Of those that received unnecessary transfusions, three occurred outside of core hours (8 pm–8 am). Re-audit identified eleven patients, seven of which received unnecessary transfusions. Rationale for transfusion included haematuria (clinically stable) or anaemia. In one patient there was no documented reasoning. Two patients were managed in accordance with the guideline and only one patient received an unnecessary transfusion out of hours.

**Conclusions:** Despite the implementation of changes, more patients received inappropriate transfusions than appropriate ones. The national guidance on the

use of blood remains underutilised, with persistent adherence to the universal use of a transfusion threshold of Hb 8 g/dl and the need for two units of red cells. This has both clinical and financial implications. Ongoing education and training is required.

## General 0421

### Post Emergency Laparotomy Pneumonia: the Size of the Problem

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**Aims:** The outcomes for emergency laparotomy are poor compared to elective surgery and variable between centres. A significant proportion of mortality and morbidity is thought to be due to respiratory complications. This study aims to investigate the impact of pneumonia post emergency laparotomy.

**Methods:** A retrospective case note analysis was undertaken of consecutive emergency laparotomies in a single centre over 8 months. Factors recorded were patient demographics, indication and procedure undertaken at emergency laparotomy, diagnosis of post-operative pneumonia, length of stay (LOS) and 30 day mortality. Incidence data were analysed using a Fisher's exact test and LOS data with a Mann-Whitney U test.

**Results:** 80 laparotomies were undertaken during the study period, 29 (36.5%) of which developed a post-operative, radiologically proven pneumonia. The overall 30 day mortality of the study group was 15% (n = 12), 27.6% (8) in the pneumonia group and 7.8% (4) for the non-pneumonic group (p = 0.02). The median total LOS for the non-pneumonic group was 8 days (IQR = 9.5), and 18 days (IQR = 15) (p = 0.02) for the pneumonia group. The median LOS on Level 3 care was 0 days for both the non-pneumonic group and the pneumonia group (p = 0.19). The median LOS on Level 2 care was 1 day for the non-pneumonic group and 2 for the pneumonia group (p = 0.01). The median LOS on level 1 care for the non-pneumonic group was 7 days and 10 days for the pneumonia group (p = 0.17).

**Conclusions:** The presence of post-operative pneumonia significantly increases the risk of mortality. The overall LOS is also significantly increased by a median of 10 days. The average added cost of post emergency laparotomy pneumonia taking into account bed space alone is £4300 per case, based on costing from the Intensive Care Society. Further studies are required to investigate preventative and treatment strategies that are clinically and cost effective.

## Emergency Surgery including Trauma (ASGBI) 0490

### Emergency General Surgery: Emergence of a Subspecialty by Stealth From a Training and Examination System not fit for Purpose

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**Aims:** Emergency surgical patients account for around half of all NHS surgical workload and 80% of surgical deaths. Few trainees opt to CCT in general surgery, and there is no recognised subspecialty training program in Emergency General Surgery (EGS). Despite this lack of training and relevant assessment by examination, there appears to be an increasing number of EGS posts advertised, which this study sought to characterise.

**Methods:** All consultant surgeon posts advertised by British Medical Journal between January 2009 and December 2014 (72 months) were included in the study. Posts in 'non-general surgical' specialties were excluded. Data collected included, specialty, additional potential interests, region and institute of advertised post.

**Results:** 1240 relevant advertisements were included in the study. Fifteen percent of all consultant surgeon posts advertised were for General Surgery and/or EGS (11.85% general, 3.46% EGS). Numbers of EGS posts advertised doubled between the first three years and last three years of the study period. 79% of all EGS advertisements were for substantive appointments. South East of England were the highest recruiters to EGS posts (8.58% of all consultant surgeon posts advertised in the region).

**Conclusions:** These data demonstrate increasing societal need for EGS consultants over the last six years and the emergence of a new subspecialty. The current training system in EGS on an 'ad hoc' basis alongside subspecialty training may not adequately prepare newly appointed consultants. This is confounded by shortened training times in pre-existing subspecialties and introduction of EWTD. In order to meet the EGS needs of the NHS, surgical training and the examination system need to be revised in order to safely meet the requirements of emergency general surgical patients.

## Emergency Surgery including Trauma (ASGBI) 0606

### Implementation of a New Concept for the Emergency Surgery Department

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**Aims:** The study describes the Emergency Surgical Team, and assesses the impact of appointing two emergency consultant surgeons to implement an Emergency Surgery Ambulatory Care (ESAC - 'hot clinics and help line), prevent readmissions and a 'front line' senior doctor in A&E and SAU.

**Methods:** The Emergency Surgery Team organization is described and a comparative retrospective review was undertaken of all surgical admissions for SAU over a period of 6 months before and after the appointment of two emergency consultant surgeons. The time for senior review in A&E/SAU, length of stay in SAU, creation of a surgical Help Line, 'hot' clinics and the surgical readmissions was audited and assessed.

**Results:** A total of 2,007 patients were admitted in SAU during 2014 and 1963 in 2013. 984 new patients were seen in 2014 by the emergency consultant surgeon. The average time for consultant review in SAU with a plan of care was 1 h: 40 minutes. 93.4% of patients were seen and a plan of care established within the target of 4 hours, compared with only 39% in 2013. Over the 6 months in 2013, 23% of patients were discharged within 12 hours of admission to SAU. In 2014, 31% of patients were discharged within 12 hours. In the 6 months in 2014 the SAU Consultants saw 378 patients as Ward Attenders in the Emergency Review Clinic ERC - 'Hot' Clinics. The surgical readmissions rate in January 2014 was 17% and dropped to 7% in August 2014.

**Conclusions:** The concept of having a surgical consultant in the 'front line' of A&E/SAU, available to review patients as needed, support the CEPOD, lead the hot clinics, provide good teaching opportunities not only improves the patients and staff satisfaction, but also optimizes the acute surgical service, increasing the effectiveness with potential financial savings for the Trust.

## Emergency Surgery including Trauma (ASGBI) 0614

### The Centralization of Emergency General Surgery leads to improved Short and Long-term Survival; Experience from 841 Emergency Laparotomies from a UK University Hospital

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Aintree University Hospital

**Aims:** The debate about the creation of dedicated emergency general surgery (EGS) units, similar to the American departments of Acute Care Surgery, has started in the UK. Outcome data of such units in the UK are rare. A dedicated EGS and trauma unit was created in our hospital between 2008 and 2009, staffed by specialist emergency general surgery and trauma surgeons.

**Methods:** A retrospective dataset was created by examining 2 time periods prior to and after the creation of the dedicated EGS service. Demographics, ASA grade and time of operation were pre-operative variables examined. Primary outcomes measured were 30 day mortality, Intensive care stay, and histological malignant diagnosis. Secondary outcomes were 3 year survival rates. Statistical analysis were conducted using the Chi squared test.

**Results:** 417 cases were conducted between 2007 and 2008 (pre EGS), and 424 between 2010 and 2011 (post EGS). Mean age was 65.7 pre EGS, and 64.5 post EGS. 35% of the pre EGS cohort had a malignant diagnosis histologically confirmed, as compared to 28% of the post EGS cohort (p = 0.04). 35% patients

had a laparotomy overnight pre EGS and 23% post EGS ( $p=0.001$ ). 30 day mortality was 21.8% pre EGS and 13.4% in the post EGS cohort ( $p=0.001$ ). The 3 year survival was 68% in the post EGS cohort, compared to 60% in the pre EGS group.

**Conclusions:** The 30-day mortality of emergency laparotomy fell and the long term survival improved. Fewer patients with malignant diagnoses were operated on emergently and the proportion of night time laparotomies fell. This was due to much greater senior surgical input into pre and peri-operative decision making.

## Emergency Surgery including Trauma (ASGBI) 0697

### Improving Care for Complex and Co-Morbid Emergency Surgical Patients: the Role of the Perioperative Physician

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Oxford University Hospitals NHS Trust

**Aims:** Pressures on acute services are relentless and intense: increasing numbers of patients are elderly. Many are frail or have a diagnosis of dementia. Caring for these patients is a big part of the work of an Emergency General Surgery Unit. Employing more surgeons to look after these patients may not be the best answer to meet their needs, improve care, and facilitate discharge. Many patients have complex medical needs and the potential role for formal medical input in optimising outcomes has been identified.

**Methods:** In a teaching hospital Surgical Emergency Unit of 71 beds, a full time perioperative physician was appointed to support the surgical team.

The role of the physician is to provide daily support to nursing and surgical staff for all medical issues; review of patients with complex chronic co-morbidities; patients with severe sepsis and organ failure; medicines reconciliation; mental health issues and capacity assessments; assist with complex discharge issues by running a social care MDT for discharge planning with nursing staff, social worker OT, physio and dietician input; antibiotic stewardship

**Results:** Appointment of a perioperative physician has led to a decrease in length of stay across all age groups, specifically of 1.1 days in patients aged 40–59, 1.6 days in patients aged 60–79 and 0.6 days in the over 80 age group. The number of bed days saved equates to a saving of £2.4 m pa. In addition the number of prescribing errors has been reduced, as have cardiac arrest calls and unplanned ITU admissions.

**Conclusions:** This Perioperative Service is the first of such services in the UK. The perioperative medicine team has now been expanded to include and senior medical trainee, a core trainee and FY1. A Perioperative medicine team improves the quality of care in a surgical emergency unit and this model should be implemented more widely.

## Emergency Surgery including Trauma (ASGBI) 0749

### Reason for Admission and Outcomes for Older Patients Admitted to a Major Trauma Centre

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**Aims:** PLEASE NOTE: This work was presented at 10th Congress of the European Union Geriatric Medicine Society and abstract published in Supplement 1 to European Geriatric Medicine, Volume 5, 2014. Resubmitted to deliver findings to trauma audience as previously presented to geriatrician audience. Numbers of older persons admitted to Level 1 trauma centres is increasing. Trauma patients are traditionally looked after by teams comprising of surgeons and anaesthetists and assessed using standardised pathways. Older trauma patients have a higher mortality than younger patients. We aimed to identify the reasons why they present as a trauma call.

**Methods:** A retrospective review of records of patients above the age of 70 admitted to a Major Trauma Centre via as a trauma call from Feb 2012 until July 2014.

**Results:** There were 5796 adult trauma calls in total. 606 (10%) were above the age of 70. Of these: Mean age 80, Range 70–99. 432/606 (71%) older patients presented as a result of a fall. 85/606 (14%) were pedestrians struck by a vehicle, 28/606 (4.6%) drivers and 9 (1.5%) cyclists. 11/606 (1.8%) were admitted as a result of deliberate self harm. 319/606 (52.6%) were discharged straight home, 118/606 (19.4%) died at the trauma centre, 121 (19.9%) required ongoing care at their local hospital.

**Conclusions:** In our study, most older patients admitted as a 'Trauma call' presented with fall. Falls in the elderly are aetiologically multi-factorial, often indicating frailty. Multidisciplinary assessment and targeted interventions can prevent future falls. Patients admitted in this way may not receive these assessments. Early mortality is high and only 50% of patients go straight home. Many require on-going care at a local hospital. Geriatricians are now routinely involved in hip fracture care but not for all trauma. Our results suggest there may be a need. We have a geriatrician attached to the trauma service.

## Audit and Outcomes Research 0856

### Maintenance IV Fluid Prescribing Reflects Poor Junior Doctor Knowledge of IV Fluids and new NICE Guidelines for IV Fluid Prescribing - Improving IV Fluid Prescribing is Difficult

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**Aims:** NICE guidelines (Dec 2013) recommend maintenance fluids providing 25–30 ml/kg/day water, 1 mmol/kg/day sodium/potassium/chloride, and 50–100 g/day glucose; representing a marked change from the traditional one salt two sweet regimen. We aimed to assess junior doctors' knowledge of these guidelines, audit adherence, and improve prescribing practices.

**Methods:** An initial questionnaire assessed junior doctor's knowledge of NICE guidelines. This was followed by three 1-week prospective audit cycles separated by two interventions (1st - junior doctor teaching, 2nd - teaching & IV fluid prescription tool).

**Results:** 45% knew NICE's recommendation for water, 55% for sodium, 73% for potassium, 73% for chloride and 55% for glucose. 18% knew electrolyte composition of Hartmann's solution, 18% for 0.9% saline, 9% for 0.45% saline + 5% dextrose and 45% for 5% dextrose. In total 43 general surgical patients received a total of 75 days of IV fluid. More than 50% of bags prescribed were Hartmann's solution, yet only 9% of junior doctors had included it when asked for an 'ideal' maintenance fluid regimen. With repeated teaching, fluid prescriptions showed a shift towards the recommended allowances, improving from 29.1 to 24.5 ml/kg water; 3.6 to 2.6 mmol/kg sodium; 0.15 to 0.3 mmol/kg potassium; 3.2 to 2.5 mmol/kg chloride and 2.9 to 18 g glucose per day. Despite the improvements, total fluid input (IV + oral) remained poorly managed, with an average daily input of 30.4 ml/kg (range of 14.1–55 ml/kg).

**Conclusions:** Junior doctors have a poor awareness of both the NICE guidelines and the electrolyte content of commonly prescribed IV fluids. Over-reliance on Hartmann's solution as the maintenance fluid of choice results in over-prescription of sodium and chloride and under-prescription of potassium and glucose. Prescribing practices can be improved, but multiple modalities and repetition of teaching are necessary to update prescribers to the latest guidelines. Assessment of the patient before prescribing any regime of fluids.

## Emergency Surgery including Trauma (ASGBI) 0885

### Accuracy of CT Reporting in the Acute Surgical Abdomen: Does Radiologist Specialty Interest Impact on Results?

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**Aims:** In the management of acute abdominal pain computed tomography (CT) assessment prior to emergency laparotomy has become omnipresent. The relative accuracy of CT in these circumstances along with the impact of the skill set of the reporting radiologist on this accuracy has not been reported extensively. The aim of this study was to determine the accuracy of the perceived

pre-operative CT diagnosis compared with the operative pathological findings to assess if the skill set of the reporting radiologist influenced this result.

**Methods:** Prospectively collected data for patients undergoing emergency laparotomy along with a pre-operative CT over one calendar year was analyzed. CT diagnosis and operative findings along with histopathological diagnoses were compared by means of the weighted Kappa statistic. Results were compared between training and consultant radiologists and also between consultants with and without specialist interest in GI radiology.

**Results:** 241 of 341 patients [70.7%, median age 67 (18–98) yr, 123 male] underwent CT prior to emergency laparotomy. Overall CT accuracy was 87.9% (Kw = 0.793, 95% CI 0.735–0.851, <0.001). Accuracy amongst training radiologists was 84.3% (Kw = 0.738, 95% CI 0.648–0.828, <0.001), as expected consultant radiologists had a slightly higher accuracy at 92.1% (Kw = 0.845, 95% CI 0.769–0.921, <0.001) but this disparity was not significantly different. Further subdividing consultants however found an accuracy of 89.2% (Kw = 0.838, 95% CI 0.750–0.926, <0.001) in non-GI radiologists compared with a 100% (Kw = 0.864, 95% CI 0.72–1.008, <0.001) accuracy in GI radiologists who reported 26.2% of all consultant reported scans.

**Conclusions:** CT concurrence with emergency operative pathology was in general very good. This level of agreement did vary based on the skill set of the radiologist performing the CT analysis. These findings support the idea of development of specialized radiologists for reporting CT scans in emergency abdominal pain patients.

## Audit and Outcomes Research 0969

### Audit of Plastic Surgery Trauma Operating: an Analysis of Waiting Times for Urgent but not Immediately Indicated Surgery Before and After an Increased Operating Capacity

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**Aims:** Plastic surgery trauma patients rarely have life or limb threatening injuries, yet represent a significant workload. Our aim was to determine if an increased trauma operating capacity reduced the delay between referral to our regional center and surgery being performed, comparing against national standards from the British Society for Surgery of the Hand.

**Methods:** A prospectively maintained database of all patients undergoing unplanned plastic surgery in our unit was queried for two separate but equivalent 30-week periods during 2012 and 2013, before and after a 25% increased operating capacity (respectively). Primary injuries were recorded at the time of listing.

**Results:** During the study period 1376 patients underwent surgery; 620 in the 2012 series and 756 in the 2013 series. Times between referral and surgery were unchanged between groups: mean 2 days and range 0–7 days before and after increased capacity. Subgroup details are in table 1. Injuries from bites (animal and human) were addressed within 24 hours in 79% (n = 19) during the 2012 period and 92% (n = 36) during the 2013 period. Flexor tendon injuries were

repaired within 5 days in 86% (n = 87) during the 2012 period and 96% (n = 108) during the 2013 period.

**Conclusions:** Despite a 25% increase in trauma lists the average wait for emergency surgery did not reduce. Despite an increased workload waiting times did not increase. Improved adherence to audit standards was observed, but half of patients remain untreated within 48 hours of referral. Units should use national guidelines to assess the timeliness of their service and to compete for increased operating capacity. With an increasing service burden factors such as efficiency of operating lists and a one-stop service should be considered.

## Audit and Outcomes Research 1054

### Is Small Beautiful? Emergency Laparotomy Outcomes in Scottish Rural Versus Non-Rural Hospitals: a 10 Year Retrospective National Cohort Study

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**Aims:** Post-operative mortality following emergency laparotomy is approximately 15% in the UK and considerable inter-hospital variation in outcome has been demonstrated. Hospital-level characteristics which affect outcome have not yet been clearly determined. This study explores the effect of hospital rurality by comparing mortality and re-admission rate following emergency laparotomy between Scotland's six remote and rural hospitals and all other Scottish non-rural hospitals which also provide a comprehensive surgical service.

**Methods:** Data on all emergency laparotomies performed in Scotland from April 2001– March 2011 were identified from the SMR01 database of in-patient admissions. Unadjusted rates were compared with a chi-squared test. The 30-day mortality rate specific to each included specific operation code was determined, allowing creation of risk quartiles of procedural mortality. Logistic regression was performed using this variable in addition to age, Charlson comorbidity index and a deprivation index, in order to produce risk-adjusted odds ratios of 30-day all-cause mortality, and 30-day emergency re-admission (for any indication).

**Results:** A cohort of 30,623 cases was identified, with a median age 65 years old. Overall Scottish all-cause post-operative mortality was 11.3% at 30 days. 30-day mortality in the 835 rural hospital cases was 9.2%, versus 11.4% in the 29,726 non-rural hospital cases, p = 0.052. However, the risk-adjusted odds ratio of 30-day mortality in rural centres was 0.62 compared to non-rural centres (95% confidence interval 0.48–0.79). 30-day re-admission rate in rural cases was 8.3%, compared with 12.4% in non-rural cases (p = 0.001). The risk-adjusted odds ratio of rural hospital re-admission was 0.66 (95% confidence interval 0.51–0.84).

**Conclusions:** Risk-adjusted Scottish administrative data demonstrates that emergency laparotomy outcomes are superior in rural hospitals, compared to non-rural. This suggests that rural hospitals are providing a high quality of emergency surgical care, even accepting that their case mix and transfer patterns are different to non-rural comparators.