

## CONTENTS

Abstracts	Numbers	Page
Session 10: Council Prize Session Friday 29 January 2016 (12:00–13:00)	A01–A06	1
Session 5: Parallel Free Paper Session - Surgical Thursday 28 January 2016 (17.00 - 18.30)	B01 – B08	3
Session 5: Parallel Free Paper Session – AHP/Nurses Thursday 28 January 2016 (17.00 - 18.30)	C01–C07	5
Session 5: Parallel Free Paper Session - APSO Thursday 28 January 2016 (17.00 - 18.30)	APS01–APS08	7
Session 7: Parallel - DVD Friday 29 January 2016 (08:30–10:00)	D01–D09	10
Session 7: Free Paper Session - Surgical and AHP Friday 29 January 2016 (08:30–10:00)	E01–E08	12
Posters	PoD1–PoD6	14
Posters	P07–P39	16

## Abstracts

## Session 10: Council Prize Session

## Friday 29 January 2016 (12:00–13:00)

## A01

**Staged Roux-en-Y Gastric Bypass reduces mortality risk in BMI>60, high risk bariatric patients**

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**Background:** Mortality after Roux-en-Y Gastric Bypass (RYGB) in high risk patients [Obesity Surgery Mortality Risk Score (OSMRS) 4–5] has been shown in several large validation studies to be 2 to 3%. As BMI is a modifiable risk factor, staged bariatric procedures have been advocated to reduce mortality risk, especially in super-super-obese patients (BMI > 60 kg/m<sup>2</sup>). We aim to investigate whether this strategy is effective in terms of risk reduction.

**Methods:** Selection criteria used for a staged approach were high BMI (males > 60 kg/m<sup>2</sup>, females > 65 kg/m<sup>2</sup>), or an OSMRS score of 4 to 5. A first stage Laparoscopic Sleeve Gastrectomy (LSG) using a 36 French bougie was followed by a completion of the RYGB at least 12 months later. Retrospective analysis of a prospectively kept database was performed on all patients undergoing 2-stage gastric bypass between September 2005 and July 2015. Outcome measures were: patient demographics, mortality risk before each stage (defined by OSMRS), 90-day mortality and reoperation rates.

**Results:** Ninety-eight patients completed a 2-stage RYGB during the study period. The median (range) time between 1<sup>st</sup> stage LSG and 2<sup>nd</sup> stage RYGB was 14 (7–58) months. One year after LSG although 87.8% remained morbidly obese, the proportion of high-risk patients (OSMRS 4 & 5) fell significantly (40% vs 11%,  $p < 0.01$ ), as did median BMI [61 kg/m<sup>2</sup> (46–85) vs 48 kg/m<sup>2</sup> (36–81),  $p < 0.01$ ]. There were also significant improvements in all modifiable OSMRS risk factors following first-stage LSG; proportion of patients with a BMI > 50 (91% vs 43%,  $p < 0.01$ ), hypertension (70% versus 56%,  $p = 0.04$ ) and sleep apnoea/VTE risk (44% vs 29%,  $p = 0.03$ ). The 90-day reoperation rate was 1% after the 1<sup>st</sup> stage, 5% after the 2<sup>nd</sup> stage, and 6% overall. Ninety-day mortality was 0% after LSG and RYGB.

**Conclusion:** 2-stage gastric bypass reduces mortality risk in high risk, high BMI bariatric surgical patients with a 0% 90-day mortality in this study that compares favourably with published data across all levels of surgical risk.

## A02

**Comparison of outcomes in patients with body mass index of more than 60 who underwent Mini Gastric Bypass and Sleeve Gastrectomy**

**Brijesh Madhok, Kamal Mahawar, Chetan Parmar, William Carr, Neil Jennings, Norbert Schroeder, Shlok Balupuri, Peter Small**

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**Background:** Patients with a body mass index (BMI) of more than 60 pose a particular challenge for bariatric surgeons. Roux-en-Y gastric bypass (RYGB) can be challenging to perform in these patients and may be associated with a higher risk of complications. Many surgeons regard Sleeve Gastrectomy (SG) to be better suited for these patients. Increasingly in our unit we consider Mini Gastric Bypass (MGB) in these patients. The aim of this study was to compare the outcomes for these two procedures performed in our unit.

**Methods:** Patients with a BMI of > 60 who underwent MGB or SG were identified from our prospectively maintained database. A retrospective analysis was carried out to compare the basic demographics, outcomes, and complications. Mann–Whitney Test and Chi Square test respectively were used for continuous and categorical data.

**Results:** Eighteen patients with a mean BMI of 67.0 who underwent MGB were compared with 56 patients with mean BMI of 65.0 undergoing Sleeve Gastrectomy. There was no mortality or early complication requiring reoperation in either group. Two patients developed late complications after MGB (1 significant symptomatic reflux, 1 marginal ulcer) and 5 patients developed significant reflux after SG ( $p = 0.78$ ). Weight loss was significantly superior with MGB at all time intervals. At 2 years, an excess weight loss of 60% was seen with MGB compared to 38% with SG ( $p < 0.0001$ ). One patient with MGB has been converted to Roux-en-Y configuration for severe reflux symptoms compared to 10 revisions (3 to MGB and 7 to RYGB) in the SG group.

**Conclusion:** Mini Gastric Bypass yields superior weight loss outcomes to Sleeve Gastrectomy as a primary bariatric procedure in patients with body mass index of >60, and may reduce the need for further revisional surgery without any increased risk of complications. It is an attractive alternative to the currently available bariatric surgical options in these challenging group of patients.

## A03

**Diagnostic validity of behavioural and psychometric impulsivity measures: An assessment of impulsivity measures in five subject groups**

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**Background:** Impulsivity denotes the tendency to act without considering consequences. Obesity and food addiction are thought to be closely related to impulsivity. A heterogeneous group of obese participants was profiled against healthy-weight controls for impulsivity measures.

**Methods:** Impulsivity was measured in 5 groups (n = 200): adult sample groups (obese bariatric, obese lifestyle, healthy weight), and adolescent sample groups (obese lifestyle and healthy weight.) Psychometric testing between groups was performed using the Stop Signal Task (SSRT: a measure of inhibitory control) and Temporal Discounting (TD: wanting smaller reward now rather than waiting for a larger reward.) Personality measures of impulsivity between groups were tested using the Barratt Impulsivity Scale and the Temperament and Character Inventory (TCI).

**Results:** A linear regression model found that using the SSRT, increasing levels of obesity are associated with greater impulsivity. This relationship was absent when testing the discounting task. Using the SSRT, obese adolescents were the most impulsive group. Adults awaiting bariatric surgery showed significantly higher levels of impulsivity than the obese lifestyle and healthy adults. The TD task could only differentiate between adolescent groups, lacking sensitivity to detect the difference between adult groups. The TCI in adolescents found that Novelty Seeking (NS) correlated positively with BMI and SSRT scores. Obese adolescents scored higher on the NS task than healthy weight adolescents. Adult personality questionnaires were not so useful to discriminate between groups.

**Conclusion:** Weight loss is related with impulsivity in both adolescent and adult obese patients. Psychometric profiling is able to distinguish between those groups who opt for lifestyle or surgical intervention. This has implications for timely selection of patients for surgery. Routine profiling of patients seeking weight management may help stratify treatment options and allow for the treatment of impulsivity as an adjunct to surgery.

## A04

### Randomised trial of Roux-en-Y gastric bypass versus sleeve gastrectomy for type 2 diabetes remission in obese patients

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**Background:** Roux-en-Y gastric bypass is proven to be effective in the management of type 2 diabetes mellitus. Observational studies suggest similar diabetes remission rates may exist following sleeve gastrectomy, however only one other randomised trial has directly compared these two procedures.

**Methods:** Randomised, assessor and patient-blinded, single centre trial, evaluating the efficacy of laparoscopic silastic ring Roux-en-Y gastric bypass versus sleeve gastrectomy in 114 obese patients with type 2 diabetes mellitus. Mean ( $\pm$ SD) age of patients was  $47 \pm 8$  years and 55% were female. Mean ( $\pm$ SD) BMI was  $43 \pm 7$  kg/m<sup>2</sup> and glycated haemoglobin  $8.0 \pm 1.4$ %. 33 (29%) patients required insulin and 36(32%) patients had diabetes for >10 years duration. The 12-month end point was the proportion of patients with glycated haemoglobin <6% without pharmacological treatment.

**Results:** Of 114 patients, 96% completed 12 months follow-up. No significant difference was seen in achievement of this end point: 52% (29 of 56 patients) following gastric bypass and 49% (28 of 58 patients) following sleeve gastrectomy. Percentage weight loss was greater in gastric bypass versus sleeve gastrectomy group ( $27 \pm 0.1$ % and  $32 \pm 0.1$ % respectively)  $p < 0.01$ . Reoperation was required in 5 patients following gastric bypass and 3 following sleeve gastrectomy. Complications were as follows: Gastric bypass – anastomotic leak (n = 1), ulcer (n = 3), upper GI bleed (n = 1), haemoperitoneum (n = 1). Sleeve gastrectomy – upper GI bleed (n = 1), stricture (n = 4), wound infection (n = 1), cholecystectomy (n = 1). 90-day and in-hospital mortality were 0%.

**Conclusion:** At 12 months Roux-en-Y gastric bypass and sleeve gastrectomy achieved similar remission of type 2 diabetes. Greater weight loss was seen following gastric bypass. Further on-going study of these patients will provide longer-term outcomes.

## A05

### Cross-sectional analyses of subjective changes in appetite, taste and smell following Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG), relationship with weight loss and influence of gender

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**Background:** Weight loss following RYGB and SG is primarily due to reduced energy intake with post-surgery subjective changes in appetite, taste, smell and food aversions suggested as key drivers. We investigated the prevalence of subjective appetite, taste and smell changes post-RYGB and post-SG and their relationship with percentage weight loss (%WL). The influence of gender and surgical procedure were also examined.

**Methods:** Patients following primary RYGB or SG attending a routine follow-up appointment were recruited and informed consent obtained. Anthropometric and clinical data were collected and patients completed a validated appetite, taste, smell and food questionnaire. %WL from day of surgery was calculated. Exclusion criteria included low zinc, vitamin B12, pregnancy and anaemia. Mann-Whitney tests were used to compare continuous data and Fisher exact tests for categorical data.

**Results:** 284 (167 post-SG, 117 post-RYGB) patients, 77% females, mean age =  $45.3 \pm 0.7$  yrs, mean pre-surgery BMI =  $45.5 \pm 0.7$  kg/m<sup>2</sup>, mean %WL =  $22.9 \pm 0.6$  and average time post-surgery  $908 \pm 45$  days were included in the final analyses. 90% of patients reported appetite changes, 58% altered taste, 30% altered smell and 61% food aversions. %WL was greater in patients with subjective appetite changes ( $23.8 \pm 0.6$ % vs.  $15.1 \pm 2.9$ %  $p < 0.001$ ), taste changes ( $25.6 \pm 0.8$ % vs.  $22.2 \pm 1.2$ %  $p < 0.05$ ) and food aversions ( $24.2 \pm 0.8$ % vs.  $21.2 \pm 1.1$ %,  $p < 0.01$ ). Pre-surgery BMI, age and subjective appetite and taste changes were similar in RYGB and SG patients. However, smell changes and food aversions were significantly more common in RYGB patients, together with greater %WL vs. SG patients. No gender differences were observed in RYGB patients. In contrast, post-SG taste changes were less common in males vs. females. In males, RYGB led to greater %WL (RYGB =  $24.1 \pm 2.1$ %, SG =  $18.4 \pm 2.0$ %,  $p < 0.05$ ), taste (75% RYGB vs. 38% SG,  $p < 0.001$ ) and smell (42% RYGB vs. 13% SG,  $p < 0.05$ ) changes were more prevalent than post-SG.

**Conclusions:** Post-operative changes in taste and food aversions associate with %WL. Future studies aimed at determining the directionality of this association and the biological mediators of these changes are warranted.

## A06

### Predictive Value of CRP for complications following Laparoscopic Roux-en-Y Gastric Bypass

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**Background:** Laparoscopic Roux-en-Y gastric bypass (LRYGB) has gained increasing popularity as the primary procedure of choice for the management of patients with morbid obesity. It can provide the benefits of faster patient recovery and reduced hospital stay. Despite these advantages a few patients will still develop complications and predicting these early complications in the morbidly obese patient can prove difficult. Radiological investigations have limited diagnostic value and have associated side effects and cost. We propose that CRP is a useful predictor for early post-operative complications.

**Methods:** We reviewed the prospectively collected hospital bariatric database for all LRYGB performed from 01/12/2010 to 30/03/2015. Patients were excluded if they underwent dual procedures, conversion to open or if no post operative CRP was performed on day 1 or 2. Complications within 30 days of surgery were documented according to the Clavien-Dindo (CD) classification.

The ability of CRP, performed on post-operative day 1 and 2, to predict early complications was assessed using ROC curve analysis.

**Results:** In total 138 patients satisfied the inclusion criteria during the study period (median age 44years [20–68], BMI 50.6 [34–63]). Seventeen (12.3%) patients had minor complications (CD of 2) and 9 (6.5%) had major complications (CD 3 or above). A CRP of greater than 127 mg/L on post-operative day 2 was found to predict complications with 93% sensitivity and 64% specificity with diagnostic accuracy 0.82 (95% confidence interval 0.731-0.908).

**Conclusion:** LRYGB is a commonly performed procedure that has a low rate of major complications. In our patients CRP on day 2 post op has been shown to be a good predictor of both minor and major complications and can therefore be used to guide clinicians decision making as to which patients may need further investigation or who can be safely discharged.

## Session 5: Parallel Free Paper Session - Surgical

Thursday 28 January 2016 (17:00–18:30)

### B01

#### Retrospective analysis of the CT findings of surgically proven internal hernias after laparoscopic gastric bypass (LRYGB)

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**Background:** Diagnosing internal hernia after gastric bypass is still demanding, even with the presence of the most advanced non-invasive technology like CT scanning.

**Methods:** All patients who had diagnostic laparoscopy for abdominal pain after LRYGB over the period from 2013–2015 in our institute were included in this study. There were 23 patients in total. In this study 2 gastro-intestinal specialist radiologist reviewed CT scans retrospectively for signs of internal hernias (IH).

**Results:** Out of 23 patients, 16 patients had IH found during diagnostic laparoscopy. Six (37.5%) of those proven IH patients had their Peterson and mesenteric defects closed during primary surgery.

Median age at primary procedure was 43 years (range 24–66 years). Male: Female ratio was 1:22. Median BMI at primary procedure was 46.5 kg/m<sup>2</sup> (range 42.3–59.9). The median time of presentation with abdominal pain post bypass was 1.5 years (range: 4 months–3 years). At the time of the presentation the median excess weight loss was 68% (range 47–98.4%) and median BMI 33.3 kg/m<sup>2</sup>. Commonest sign for those patients at CT was “Swirl sign” 7/16 (44%) and “mesenteric oedema” 7/16 (44%). Pre-operatively, 6/16 (38%) had 2 or more of 9 known documented CT signs of internal hernia while 5/16 (31%) had no signs. Out of 23 patients there were 7 cases of no internal hernia: 1 patient had the IH spaces closed at the primary operation. Even in these patients Swirl sign was present in 3(43%) and mesenteric oedema in 2 (29%). 3(43%) had 2 or more of 9 previously documented CT signs pre-operatively. Pre-operatively 3(43%) had no signs at CT.

**Conclusion:** This study shows that the absence of CT finding should not preclude laparoscopic examination to rule out IH. The incidence of IH is a late event which occurred at a time when patient had lost most of the expected weight- this may reflect the increase in the size of hernial orifices with the loss of the intra-abdominal fat.

### B02

#### Serum copper and zinc levels are lower post laparoscopic Mini vs. Roux-en-Y gastric bypass at 1 year follow up: A prospective audit

Maureen Boyle, Numan Hamza, Kamal Mahawar, Nicola Young

*Bariatric Unit Sunderland Royal Hospital, Sunderland, UK*

**Background:** Nutritional supplements after bariatric surgery are necessary to prevent nutritional deficiencies. The aim of this project was to establish whether there is a difference in the copper and zinc serum values post laparoscopic Roux-en-Y gastric bypass (LRYGB) vs. Laparoscopic Mini gastric bypass (LMGB) in the management of morbid obesity.

**Methods:** A retrospective analysis of the serum copper and zinc values of all cases of LRYGB & LMGB carried out at our unit. The data are presented as median (interquartile range-IQR), Mann-Whitney U test was employed for intergroup comparisons, and *p* value of 0.05 was considered statistically significant.

**Results:** Between June 2015 and August 2015 121 consecutive patients (92 female) underwent 99 LRYGB and 22 MGB procedures. All the patients were advised to take one multivitamin tablet daily as per our unit protocol. At one year follow up, the serum copper levels were 19.4 (17.8–21.3) µmol in the LRYGB group (n=44) in comparison with 16.6 (13.6–19.4) µmol in the LMGB group (n=12) (*p*=0.027). Likewise, the zinc levels were statistically significantly higher in LRYGB vs. LMGB, 10.6 (9.8–11.8) µmol and 9.9 (8.5–10.5) µmol respectively (*p*=0.035). At 2 years postoperatively, the difference was not significant, probably due to smaller numbers. The copper values were 19.2 (17.2–21.3) µmol and 17.7 (16.9–18.8) µmol respectively in the LRYGB (n=55) and LMGB (n=10) (*p*=0.248). Similar trend was noted in zinc measurements; 11.3 (9.5–11.7) µmol in the LRYGB vs. 11.0 (9.8–12.4) µmol in the LMGB, (*p*=0.434).

**Conclusion:** Significantly lower copper and zinc serum levels were observed in the LMGB patients in comparison to LRYGB at 1 year postoperatively. Our current protocol for supplementation following LRYGB seems adequate but consideration could be given to increasing these following LMGB.

### B03

#### Is a second operation always required after intended 2-stage RYGB in high risk bariatric surgical patients?

Ashok Menon, Andrew Harris, Shafiq Javed, Euan Shearer, David Kerrigan

*Phoenix Health, Chester/Liverpool, UK*

**Background:** Staged bariatric procedures have been advocated to reduce mortality risk, especially in the super-super-obese (BMI > 60 kg/m<sup>2</sup>). For various reasons, some patients never have the second stage procedure. We aim to investigate the reasons why some patients do not complete the intended treatment.

**Methods:** Selection criteria for a staged RYGB were either high BMI (males > 60 kg/m<sup>2</sup>, females > 65 kg/m<sup>2</sup>) or OSMRS of 4–5. The planned surgical treatment was a first stage Laparoscopic Sleeve Gastrectomy (LSG), followed by a second stage completion RYGB at least 12 months later. Retrospective analysis of a prospective database was performed on all patients having a LSG as part of an intended two-stage RYGB between September 2005 and November 2014.

**Results:** 113 patients met the selection criteria for staged RYGB, with 98 (86.8%) undergoing completion of the second-stage RYGB 14 months (7–58) [median (range)] after the initial LSG. Fifteen patients (13.2%) did not have a second stage operation for the following reasons; currently awaiting second-stage procedure (1.7%), patient choice despite high BMI (2.7%), successful weight loss (BMI < 40) with LSG-alone (4.4%), medical issues delaying or precluding further surgery (2.7%), and psychological/compliance issues (1.7%). One year after LSG in the 15 patients who did not proceed to RYGB, BMI fell significantly (pre-op 58 vs post-op 41, *p*<0.01), but 66.7% remained morbidly obese (BMI > 40). However, the proportion of high risk patients (OSMRS 4–5) fell significantly (80% versus 13%, *p*<0.01).

**Conclusion:** In high risk/high BMI patients requiring RYGB, initial LSG significantly reduces BMI and OSMRS, but most patients remain morbidly obese and so ultimately a second stage procedure is still required in the majority of patients.

## B04

## Polycystic ovary syndrome and bariatric surgery

James Butterworth<sup>1</sup>, Jean Deguara<sup>2</sup>, Cynthia-Michelle Borg<sup>1</sup><sup>1</sup>University Hospital Lewisham, London, UK, <sup>2</sup>Kingston Hospital NHS Foundation Trust, Kingston-upon-Thames, UK

**Background:** Visceral obesity and insulin resistance are key pathophysiological mechanisms behind polycystic ovary syndrome (PCOS). PCOS is the commonest cause of female infertility and women suffering from this syndrome often seek bariatric surgery hoping that they would be able to conceive post-operatively. At present, there is no consensus on the role of bariatric surgery in the management of PCOS-associated infertility, making it difficult to give specific advice to these women.

**Methods:** A review of the literature regarding the role of bariatric surgery in management of infertility associated with PCOS was performed. Pubmed, Embase 1974 to 2015 March 20 and Medline and Medline Non-indexed items were searched and reference lists were scanned for relevant manuscripts.

**Results:** 68 manuscripts were identified of which only 6 manuscripts were relevant and contained quantitative data. These studies were retrospective and only had small number of participants with infertility. They demonstrated that bariatric surgery results in postoperative conception rates varying from 33% to 100%. Surgery is also associated with amelioration of menstrual irregularities, hormonal abnormalities and hirsutism that are associated with PCOS.

**Conclusions:** Bariatric surgery has been shown to conclusively improve life expectancy, quality of life and co-morbidities like type 2 diabetes and obstructive sleep apnea. Further research is however required to identify whether weight loss surgery results in significant improvement in fertility of women with PCOS, to investigate which operation has the best results and to identify a cut-off BMI.

## B05

## Should the hiatus hernia be repaired at the time of Sleeve Gastrectomy - How? Experience of 93 Sleeves

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**Background:** Gastro oesophageal reflux can be debilitating in patients who had Sleeve Gastrectomy SG if there is hiatus hernia. The question is whether it has to be repaired at the same time? There is a lot of controversy about it. Acid Reflux can be debilitating following SG.

**Methods:** We looked at the results of all the 93 patients who had single stage SG and the hiatus hernia repaired at the same time from 2008 till November 2015. There are two groups of patients - 1. SG and the hiatus hernia alone repaired. 2. SG and Hiatus hernia repair with oesophageal or Fundal fixation to crus. The end point is whether they had GORD after surgery and if so anything else was performed

**Results:** In the first group of 63 patients where the hiatus hernia was only repaired but not the oesophageal fixation, the stomach migrated partly into mediastinum and had GORD and have to be either the hiatus hernia repair was done again with oesophageal fixation, or converted to Gastric bypass in persons with severe reflux in 5 of them. In one of them SG has to be converted to gastric bypass within 2 months. In the second group of 30 patients where the Oesophageal fixation was also performed, there was no migration of the stomach and no reflux problems

**Conclusion:** Hiatus hernia has to be sought out even if it is not evident on initial laparoscopy. It is imperative to repair the hiatus hernia along with fixation of the oesophagus and or fundus to the crus to prevent migration of stomach into chest when the weight loss and reduction of fat occurs which makes the 'sleeve' to ride up into chest. SG should not be performed if there is severe GORD. We have to establish whether we have to do oesophageal physiology studies - 24 hr pH and HRM in these patients undergoing SG. A multicentre trial is necessary to establish best evidence based practice with the current popularity in the SG.

## B06

## Temporal improvements in total bile acid levels following laparoscopic sleeve gastrectomy

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**Background:** Bariatric surgery can result in type 2 diabetes remission, even before a decrease in weight, and usually coincides with changes in metabolic and hormonal effects. The underlying mechanisms for these effects are incompletely understood, but alterations in bile acids have been proposed to influence some metabolic changes following surgery. Bile acids are essential for digestion and absorption of lipids, but more recently have been recognised for their influence on whole-body metabolism, most notably the efficacy of sequestrants in improving glycaemic control in type 2 diabetes. The aim of the study was to investigate both static and dynamic measures of total bile acids in a cohort of subjects with impaired glucose homeostasis undergoing bariatric surgery.

**Methods:** A non-randomized prospective study of 16 participants (6 male, 10 female; mean pre-operative weight 148.3 ± 31.3 kg) undergoing laparoscopic sleeve gastrectomy. Oral glucose tolerance tests (OGTT) were performed pre-operatively and 1 and 6 months post-operatively. Measurements of fasting and 2-hour plasma total bile acids were recorded.

**Results & Conclusion:** Significant reductions were observed in mean weight at both 1 and 6 months post-operatively (16.5 kg and 32.2 kg respectively;  $p = 0.011$ ). We also observed significant changes in waist, hip, HbA1c, leptin and adiponectin measurements. Fasting total bile acid levels were not significantly different between post-operative visits, but were significant when comparing fasting and 2-hour values pre-operatively ( $9.01 \pm 2.6$  vs  $7.16 \pm 2.4$   $\mu\text{mol/L}$ ;  $p = 0.005$ ). Furthermore, significantly higher 2-hour total bile acids were observed post-operatively at all-time points (paired t-test: 0–1 month  $p = 0.020$ ; 0–6 months  $p = 0.004$ ). When using area under the curve analysis, there was a significant increase in total bile acids over the 2-hour OGTT at 6 months compared to baseline ( $p = 0.017$ ). Mean total bile acids were significantly correlated with mean CRP ( $r = -0.347$ ;  $p = 0.016$ ), a marker of inflammation. More investigation is needed to understand the connection between bile acids and the metabolic improvements seen after bariatric surgery.

## B07

## What do patients who want bariatric surgery, think about a weight management service intervention?

Vanessa Snowdon-Carr, Alice Weaver

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**Background:** Managing weight is a dynamic process in which relapse (and weight regain) is possible at any stage. Whilst bariatric surgery is accepted to be the single most effective treatment for weight loss it is also recognized that long term outcome is significantly influenced by patient factors. Conflicting evidence regarding which factors predict post-surgery outcome has resulted in a lack of coherent understanding about the usefulness or otherwise of treatment within a specialist weight management (WM) service prior to bariatric surgery referral. Whilst the issue of WM utility continues to be emotive between clinicians and commissioners, absent from the debate to date has been the patient perspective.

**Methods:** A mixed method service evaluation using an in-house questionnaire was conducted using patients referred from one specialist WM service into a bariatric surgery service. The questionnaire comprised of 18 questions each with a 5-point Likert response. 75% of those referred completed a questionnaire ( $n = 39$ ) during a 12 month period. Data was triangulated using a purposeful sampling method. Individual interviews were conducted with 10 patients in their own homes and recorded for transcription.

**Analysis:** Quantitative results from the survey questionnaire were recorded and trends described. Thematic analysis using an inductive approach was used to analyze the interview data.



**Results:** Data from the questionnaires revealed high levels of overall satisfaction with the WM service, 87% feeling more in control of their eating patterns and for 90% a better understanding about their relationship with food. 87% indicated the WM service helped them to prepare for eating changes post-operatively. 26% felt the Weight loss target (WLT) caused a delay to their referral for surgery, 85% felt the WLT had helped them to make changes to their eating habits. Themes generated included helplessness, recognizing the challenge, tentative confidence and weighing up value. The themes of shift, responsibility and relationships were central.

**Conclusion:** The use of interviews to triangulate questionnaire data revealed a rich and useful data set. Initial negative feelings about needing to lose weight prior to 'qualifying' for a referral to surgery and self-doubt about their ability to achieve the 10% WLT was replaced with greater levels of confidence connected to their belief that they would be better able to maintain weight loss post-operatively accepting their responsibility in working with their chosen surgical procedure. This extended service evaluation highlights the ways in which patients value a WM intervention and whilst there are a range of feelings about the WLT, qualitative data revealed it provides a focus to address some of the emotional and behavioural difficulties previously experienced with food and eating patterns. This would suggest a WM intervention can enhance self-efficacy, confidence and preparation for surgery from a patient perspective.

## B08

### Upper Gastrointestinal Surgeon attitudes towards management of refractory gastro-oesophageal reflux disease in obese patients.

Walced Al-Khyatt, Altaf Awan, Ashok Bohra, Sherif Awad, Paul Leeder

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**Background:** The marked increase in prevalence of obesity has been associated with an increase in obese patients seeking surgical treatment for refractory gastro-oesophageal reflux disease (GORD). The management of GORD in such patients remains contentious with no published guidelines.

**Methods:** A snapshot 9-item online survey was undertaken to elicit professional opinions of AUGIS/ BOMSS members regarding the surgical management of medically refractory GORD in obese patients.

**Results:** Eighty one surgeons completed the survey. Sixty-six (82%) and 41 (51%) surgeons perform more than 10 anti-reflux procedures and more than 10 bariatric procedures per year, respectively. Sixty-one (79%) would consider laparoscopic fundoplication as the preferred option for management of refractory GORD in patients with body mass index (BMI) of 30–34.9 kg/m<sup>2</sup>. In contrast, 58% and 80% would discuss bariatric surgery as an alternative treatment option for refractory GORD in patients with BMI 35–39.9 and ≥40 kg/m<sup>2</sup>, respectively. Moreover, 74% and 58% of respondents considered a bariatric procedure the preferred option in patients, respectively, with BMI ≥40 kg/m<sup>2</sup> with refractory GORD, or BMI ≥35 with refractory GORD and significant comorbidities. Eighty percent of surgeons agreed that laparoscopic Roux en-y gastric bypass (LRYGB) was the preferred bariatric procedure for management of obese patients with documented GORD. Nevertheless, bariatric surgery was not a preferred option for surgeons due to the lack of level one evidence (15%), national consensus (26%), difficulty to refer a patient for bariatric surgery (12%) or the patient's attitudes towards bariatric surgery (16%).

**Conclusion:** Our survey demonstrated that amongst upper gastrointestinal surgeons in the United Kingdom, bariatric surgery was a preferred option for management of patients with refractory GORD, with a BMI ≥35 kg/m<sup>2</sup>. For these patients, LRYGB is considered the procedure of choice. Updated national guidelines are required to reach consensus on the management of GORD in obese patients.

## Session 5: Parallel Free Paper Session – AHP/Nurses

Thursday 28 January 2016 (17:00–18:30)

### C01

#### General practitioners' attitude towards bariatric surgery: are the young really less prejudiced?

Emma Rose McGlone, Laura Wingfield, Myutan Kulendran, Marcus Reddy, Omar Khan

*St George's Hospital, London, UK*

**Background:** General practitioners (GPs) are the gate-keepers in terms of referral for weight loss surgery (WLS). There is however very little UK data available regarding GPs attitude toward WLS. Studies from the USA have noted some resistance to referral, mainly from more senior primary care physicians. The aim of this pilot study was to assess GPs' attitudes towards WLS in the UK.

**Methods:** An electronic survey was emailed to GPs in practices in Norfolk, London and Yorkshire. Questions related to responders' demographics, as well as their knowledge and opinions regarding the role of WLS.

**Results:** Of 31 responders, 15 (48%) were male and 16 (52%) female. Nine (29%) were junior GPs (defined as those in practice for 6 years or less), whilst 22 (71%) had been working as GPs for longer than 6 years. Over the previous year, female GPs had on average referred three times more patients to a bariatric surgeon than male GPs ( $p=0.17$ ). Junior GPs had referred on average 1.5 times more patients than senior GPs ( $p=0.58$ ). In response to the statement 'Being obese is a lifestyle choice', 33% of male GPs either agreed or strongly agreed compared to 25% of female GPs ( $p=0.70$ ). In response to the statement 'WLS undermines other weight loss methods', 11% of junior GPs agreed compared to 23% of senior GPs ( $p=0.64$ ). To the statement 'WLS should not be funded on the public health system', 33% of male GPs agreed compared to 6% of female GPs ( $p=0.08$ ); and 56% of junior GPs agreed compared to 5% of senior GPs ( $p=0.004$ ).

**Conclusion:** Although we found no significant differences in overall referral rate for WLS based on seniority or gender, a significantly greater proportion of junior than senior GPs feel that bariatric surgery should not be funded on the NHS. This may indicate a need for better education programmes to highlight the role and importance of bariatric surgery, particularly amongst junior GPs and GPs in training.

### C02

#### The association of interpersonal relationships and social support with early post-surgery weight loss

Urszula Tymoszuk<sup>1</sup>, Andrea Pucci<sup>5</sup>, Wui Hang Cheung<sup>5</sup>, Marco Adamo<sup>2</sup>, Majid Hashemi<sup>2</sup>, Andrew Jenkinson<sup>2</sup>, Mohamed Elkalaawy<sup>2</sup>, Amy Kirk<sup>2</sup>, Helen Kingett<sup>2</sup>, Anita Tschiala<sup>2</sup>, Kayon Carr-Rose<sup>2</sup>, Jacqueline Doyle<sup>2</sup>, Mai Stafford<sup>4</sup>, Meena Kumari<sup>3</sup>, Rachel Batterham<sup>5</sup>

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**Background:** Bariatric surgery is currently the most effective weight-loss treatment for patients with severe obesity, however post-surgery weight loss is highly variable. We hypothesized that social support and good quality interpersonal relationships would impact upon the patient's ability to make required changes to eating behaviour and lifestyle post-surgery and thus impact upon weight loss.

**Methods:** Between November 2014 and June 2015 patients (scheduled to undergo primary sleeve gastrectomy or Roux-en-Y gastric bypass) were invited to participate and informed consent was obtained. Patients completed a questionnaire that included questions on employment status, education level, self-esteem, social support and interpersonal relationships quality and quantity. Anthropometric data were collected at 4 and 12 weeks post-surgery and percentage weight loss (%WL) calculated. Descriptive statistics and one-way ANOVA tests were carried out on 142 patients using statistical programme STATA 13.

**Results:** Pre-surgery mean body mass index (BMI) was 45.2 kg/m<sup>2</sup>, and decreased to 41.2 kg/m<sup>2</sup> at 4 weeks, and 38.4 kg/m<sup>2</sup> at 12 weeks post-surgery. Pre-surgery BMI was negatively associated with marital satisfaction,  $p = 0.02$  and satisfaction with the closest person ( $p < 0.01$ ) and positively with the number of friends seen per month ( $p = 0.04$ ). %WL at 4 weeks post-surgery was associated with employment status (employed 9.4% vs. unemployed 7.8%,  $p < 0.01$ ), seeing more friends per month (none 6.8% vs. 6 and more friends 9.6%,  $p = 0.03$ ) and emotional support ( $p = 0.05$ ). Emotional support was also marginally positively associated with %WL at 3 months ( $p = 0.05$ ).

**Conclusion:** The quality and quantity of interpersonal relationships is associated with early post-surgery weight loss and suggest that optimizing patient support post-surgery might enhance weight loss. Future analyses will include additional time points of 6 and 12 months as well as an analysis of the trajectories of weight loss by baseline social support and marital status.

### C03

#### The effectiveness of Nurse-Dietitian led Group Sessions before and two weeks after Laparoscopic Sleeve Gastrectomy and its relation to 6 month weight loss

Neha Shah, Jenny Abraham, FT Lam, Milan Piya, Vinod Menon

University Hospitals Coventry and Warwickshire NHS Trust, Coventry, UK

**Background:** Patients undergoing bariatric surgery attend appointments with multiple health professionals. We have previously shown that combined nurse-dietitian led group sessions 3 weeks before surgery are a cost-effective method of providing information to patients, reducing the number of hospital visits, dramatically reducing the DNA rates and ultimately reducing time for patients from initial referral to surgery. We also showed that this session was well received with a 9.5/10 rating on patient satisfaction. Following this positive feedback, we started a similar group session 2 weeks post-operatively. However, we previously did not have data to support the effectiveness of these group sessions.

**Aim:** To assess the effectiveness of a nurse-dietitian led group session before a sleeve gastrectomy on weight loss during the 2 week long pre-op VLCD. To also assess if weight loss on the VLCD or weight loss 2 weeks post-op could predict weight loss at 6 months.

**Method:** All sleeve gastrectomy operations performed from May 2014 to September 2015 in a single surgical centre had weights recorded before the start of the VLCD, on admission for surgery, and post-op at 2 weeks as well as at 6 months.

**Results:** 83 sleeve gastrectomies were performed with age 49.2 ± 9.9 yrs (mean ± SD), 73.5% female, 48% type 2 diabetes and heaviest BMI recorded was 51.0 ± 5.3 kg/m<sup>2</sup>. Total percentage excess weight loss (%EWL) at 6 months was 49.6 ± 15.0%. %EWL with the pre-op VLCD (8.3 ± 5.1 kg) was significantly greater than %EWL in the 2 weeks post-op (6.4 ± 3.7 kg,  $p = 0.02$ ). The %EWL on the VLCD had no correlation with %EWL at 6 months ( $R = 0.07$ ,  $p = \text{NS}$ ), but the 2-week post-op weight loss correlated with %EWL at 6 months ( $R = 0.31$ ,  $p = 0.03$ ). There were no mortalities or post-op complications, and all operations were laparoscopic apart from one planned open surgery.

**Conclusion:** A combined nurse-dietitian led group session prior to sleeve gastrectomy resulted in significantly greater weight loss during the 2 week VLCD compared to a similar period post-op. The %EWL in the 2-week post-op period could be a predictor of 6 month %EWL following sleeve gastrectomy, although longer term studies are needed to see if it correlates with long term weight loss. Sleeve gastrectomy was found to be a safe and effective operation, with total %EWL of 49.6% at 6 months with no post-op complications.

### C04

#### Benefit of routine histopathology testing for sleeve gastrectomy specimens

Dhriti Dosani<sup>2</sup>, Roxanna Zakeri<sup>1</sup>, Sapna Gupta<sup>1</sup>, Pratik Sufi<sup>1</sup>, Ali Alhamdani<sup>1</sup>, Mohammad Howlader<sup>1</sup>

<sup>1</sup>The Whittington Hospital NHS Trust, London, UK, <sup>2</sup>University College London Medical School, London, UK

**Background:** Sleeve gastrectomy (SG) is a popular procedure for weight loss in morbid obesity. Currently, there is debate within the literature of the most beneficial practice for histopathological testing of surgical specimens: some studies propose routine examination<sup>(2)</sup> whilst others recommend selective testing<sup>(1)</sup>. Our unit consists of 4 bariatric surgeons, who perform a total average of 100 SG procedures per year. Histological testing of each specimen takes 30 minutes and costs £65. Our aim is to evaluate the benefit of routine histopathology testing for SG specimens.

**Methods:** Retrospective review of gastric specimen findings from laparoscopic SG patients over a 5 year period (November 2010–2015). Case notes were analysed for patient demographics, pre-operative gastroscopy findings, operation notes and histology reports.

**Results:** 106 specimens were sent for histology, with one case excluded as the indication for surgery was a Dieulafoy lesion, not morbid obesity. Of those sent for histological testing, median age was 44 years and median body mass index 47.5 kg/m<sup>2</sup> (range 36.1–68.2 kg/m<sup>2</sup>). Female to male ratio was 2.7:1. Pre-operative gastroscopy, carried out on 79% of these patients as part of bariatric work-up, was abnormal in 43 cases. Results showed gastritis, oesophagitis or duodenitis in 31 cases, 22 hiatus hernias, 4 ulcers and 3 cases of polyps, one of which was found to be a neuroendocrine tumour. All 10 patients found positive for Helicobacter pylori commenced treatment prior to surgery. Histological testing identified 82 abnormal specimens (78%). Findings included chronic gastritis in 78 cases (74%), and 1 case each of autoimmune gastritis and atrophic gastritis. 4 fundic polyps were found (4%), as were 2 gastrointestinal stromal tumours (2%), 4 cases of hyperplasia (4%) and 2 neuroendocrine tumours (2%), including one previously detected on gastroscopy. Both neuroendocrine tumours were followed up by MDT discussion, postoperative endoscopy and blood tests, however no further surgery was performed.

**Conclusion:** Our results show that routine histological testing of sleeve gastrectomy specimens can be justified, as significant abnormal findings necessitated deviation from the routine bariatric pathway, and overall cost was low, £6,435 in the past year.

### C05

#### Comparing knowledge and provision of contraceptive care by bariatric surgical and sexual and reproductive health practitioners

Yitka Graham<sup>1</sup>, Diana Mansour<sup>3</sup>, Scott Wilkes<sup>1</sup>, Kamal Mahawar<sup>2</sup>, Ken McGarry<sup>1</sup>, Sarah Gatiss<sup>2</sup>, Kim Hinshaw<sup>2</sup>, Peter K Small<sup>2</sup>

<sup>1</sup>University of Sunderland, Sunderland, UK, <sup>2</sup>City Hospitals Sunderland NHS Foundation Trust, Sunderland, UK, <sup>3</sup>Newcastle Upon Tyne NHS Foundation Hospitals Trust, Newcastle Upon Tyne, UK

**Background:** In the UK, over 80% of bariatric surgical patients are female and of reproductive age. Bariatric surgery may improve fertility increasing a risk of pregnancy. There is limited research on the effects of rapid weight loss and potential nutrient deficiencies on mother and baby. Guidelines recommend avoiding pregnancy for up to 24 months post-surgery. Contraception is an important issue and is provided by a wide range of practitioners in the UK, but little is known about current practices for bariatric patients. The aim of the surveys was to understand the contraceptive knowledge and provision by bariatric and contraceptive practitioners.

**Methods:** Two anonymous on-line surveys were distributed to targeted groups of practitioners; one was sent to BOMSS members to establish baseline data of current knowledge and practices of contraception. The second survey was sent

to a wide range of NHS contraceptive providers in the North East of England. Practitioners were asked to complete the surveys within 2 weeks.

**Results:** Most responses from the first survey (BOMSS members) were surgeons. 97% of respondents acknowledged the need to educate patients, but contraceptive information was only available in 7% of units. Over half (56.5%) were not confident discussing contraception and 83% wanted more training, with national guidelines and meetings requested. GP's (29%) formed the majority of responses to the second survey. Three quarters (75%) reported little knowledge of bariatric surgery. Two thirds (62%) were unaware of any published guidance for contraception in bariatric surgical patients and contraceptive practices varied within the different sexual and reproductive health settings.

**Conclusions:** Practitioners in British bariatric surgical units and contraceptive clinics have unmet educational needs. Patient pathways between these services are in their infancy and there is a need to increase knowledge levels of contraception within bariatric surgical teams, and of bariatric surgical procedures within contraceptive care settings. We recommend improving communication between these two groups, developing joint educational events and national contraceptive guidance for women undergoing bariatric surgery.

## C06

### Evaluation of Dietitian led bariatric follow up clinics

**Maureen Boyle, Esther Walton, Nicola Young, Fiona Macleod, Pam Rae**

*Bariatric Unit Sunderland Royal Hospital, Sunderland, UK*

**Background:** Significant expansion in numbers of patients undergoing bariatric surgery within our service has meant that the demand for follow up clinic slots far outstrips the supply of combined consultant dietetic clinics. A recent service review suggested replacing 6, 12, and 18 month follow up clinics with Dietitian only clinics. Patients continue to be seen in combined clinics at 6 weeks and 24 months after surgery. This survey evaluates patient experience with these clinics.

**Methods:** A 15 point patient satisfaction questionnaire was designed and given to consecutive patients following review in the Dietitian only clinics. These were analysed anonymously.

**Results:** A total of 100 questionnaires were returned. Most patients felt dietetic advice was very helpful with 90% scoring 8–10 (scale 0–10). Patients found the advice excellent and staff knowledgeable, helpful and friendly. 10% (n=10) expected to see a consultant during clinic but only 1 patient was unhappy. 78% (n=78) found the dietetic resources useful, with comments requesting meal plans and more detailed information following surgery. 95% were extremely likely or likely to recommend the service to friends or family with no one unlikely to recommend the service.

**Conclusion:** Patient feedback was very positive on our dietetic led bariatric follow up clinics. The survey highlighted some areas for improvement which have been addressed.

## C07

### The development of a bariatric surgical patient-led mobile app to identify bariatric-friendly eating places

**Yitka Graham<sup>1</sup>, Neil Jennings<sup>2</sup>, Peter K Small<sup>2</sup>, Liz Allan<sup>3</sup>, Kamal Mahawar<sup>2</sup>, Shlok Balupuri<sup>2</sup>, William Carr<sup>2</sup>, Arun Sekhar<sup>2</sup>, Jonathan Ling<sup>1</sup>**

*<sup>1</sup>University of Sunderland, Sunderland, UK, <sup>2</sup>Sunderland Royal Hospital, Sunderland, UK, <sup>3</sup>NHS England, Newcastle Upon Tyne, UK*

**Background:** Patients participating in study exploring adjustment to life after bariatric surgery reported that eating out in restaurants can be problematic. Patients felt they were often placed in uncomfortable situations in restaurant settings, where they were subjected to scrutiny, e.g., portion sizes, food choices and the pace of their eating. High levels of non- or selective disclosure amongst bariatric patients were common, with patients feeling compelled to reveal their decision to undergo bariatric surgery to restaurant staff in an attempt to justify

their eating behaviour. Patients report reluctance to eat in restaurants for fear of having to reveal the reasons for eating differently. Currently it is difficult to identify which restaurants are able to accommodate the needs of bariatric patients without disclosing the reasons why. Eating in restaurants was often stressful as a result.

**Methods:** Post-surgical patients attending patient support groups and participating in regional, closed, bariatric surgical patient support social media groups were asked to support the development of a mobile app to create a database of bariatric-friendly restaurants in the North East of England, based on patients' experiences, which could be shared amongst users who chose to download the app. Under the developers' terms, 100 people were required to support the app in a two week period in August 2015 for the idea to go forward.

**Results:** Following the initial request for support, 157 signatures of support were obtained within four days. Participants contributed towards the design and development of the app and the process allowed interactive discussion and collaboration between developers, researchers and patients. The app, which the participants named Slim Pickings, went live on Google Play and iOS in October 2015.

**Conclusion:** The app design process allowed patients, developers and the bariatric surgical team to interactively work together to produce an end-user support tool. Patients reported the experience as positive, feeling their needs were being listened to. Engaging bariatric patients as active participants in the development of support tools allows opportunities for continued engagement and is recommended.

## Session 5: Parallel Free Paper Session - APSO

**Thursday 28 January 2016 (17:00–18:30)**

### APSO1

#### The current provision of Tier 3 Services in the Obesity Care Pathway remains deficient nationally

**Katharine Knight<sup>2</sup>, John Wass<sup>1</sup>**

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**Background:** 2012 saw the publication of the Royal College of Physicians' report, 'Action on Obesity', calling for an increasing need for multi-disciplinary teams (so-called 'Tier 3 services') across the UK (a nation in which approximately 25% of adults are obese) to deal with the problem of complex obesity (obesity with co-morbidities). Three years on, we wanted to find out if the situation had improved in line with the RCP's recommendations in the report.

**Methods:** A self-administered questionnaire was sent to 791 health professionals in England and Wales, of which the vast majority were diabetes and endocrinology consultants; it asked about the existence of a Tier 3 Obesity service, its composition, and its place in the obesity care pathway locally.

**Results:** We received 169 responses (21% response rate) from within 76 discrete Commissioning Care Group (CCG) boundaries, representing 36% of the total number (209) of CCGs. Of those who responded, 96 (60%) reported a Tier 3 service and 64 (40%) did not. Two-thirds of these Tier 3 services are based in secondary care, slightly less than 20% in primary and secondary care, and just over 8% in primary care alone. Respondents reported that the CCG was responsible for commissioning these services in just over 50% of cases. In two-thirds of cases, the Tier 3 service was linked to a Tier 4 (bariatric surgery) service. Within the London area, out of a total of 22 CCGs, we received positive reports of a Tier 3 services from within just 7 of these. Across the country, the majority (43, or just over 70%) of respondents who did not report a Tier 3 service currently replied that either there was no plans to introduce one or there were unsure of any such plans.

**Conclusion:** When an earlier survey was commissioned in 2012, only 35% of respondents reported the existence of a Tier 3 service; the new figure of 60% represents an improvement on this, although there are still many areas of the country that lack these services. There is an urgent need to expand the reach and extent of Tier 3 services – the goal being to have one in most District General Hospitals and each CCG territory, ensuring the path to Tier 4 bariatric surgery



services where necessary. To accomplish this, commissioning and leadership by diabetes and other physicians is essential.

## APS02

### Liraglutide 3.0 mg efficacy and safety are similar across baseline Edmonton Obesity Staging System (EOSS) categories: post hoc analysis

Nick Finer<sup>1</sup>, Raj Padwal<sup>2</sup>, Robert Kushner<sup>3</sup>, Claus Bo Svendsen<sup>4</sup>, Arya Sharma<sup>5</sup>

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**Background:** Obesity is associated with increased mortality. The SCALE trials evaluated the efficacy and safety of liraglutide 3.0 mg, adjunctive to diet and exercise, for weight management. The EOSS classifies obesity based on comorbidities and functional status and out-performs BMI in predicting mortality. This *post hoc* analysis evaluated weight loss (WL; primary endpoint), secondary endpoints and overall safety from the 2 trials in EOSS subgroups.

**Methods:** Adults (BMI  $\geq 27$  kg/m<sup>2</sup> with  $\geq 1$  comorbidity or  $\geq 30$  kg/m<sup>2</sup>) randomized to liraglutide 3.0 mg or placebo were assigned an EOSS score using available data. Week 56 data are for exposed individuals with  $\geq 1$  post-baseline assessment with LOCF.

**Results:** By definition, more individuals with T2D had a baseline EOSS score of 2 or 3. Mean age, body weight, BMI and SBP increased with baseline score. Consistently across EOSS stages, greater WL and improvements in cardiometabolic risk factors (A1C, SBP, lipids) and physical function were seen at week 56 with liraglutide 3.0 mg vs. placebo. With liraglutide 3.0 mg WL was 7.4–8.1% in individuals without T2D and 5.8–6.5% in those with T2D. In the placebo group WL was 2.3–3.1% in individuals without T2D and 1.8–3.2% in those with T2D. Treatment effects were generally independent of baseline EOSS score (interaction p-value  $> 0.05$ ). Overall adverse events and serious events were similar across EOSS subgroups. Pulse increased with liraglutide 3.0 mg (1.9–2.6 bpm) vs. placebo (–3.9–0.9 bpm); treatment difference 2.0–6.5 bpm,  $p < 0.05$  across EOSS scores.

**Conclusion:** Effects of liraglutide 3.0 mg, as adjunct to diet and exercise, on weight loss, associated metabolic effects, physical function and clinical safety profile were generally consistent across baseline EOSS scores.

Keyword(s): GLP1

## APS03

### Assessment of the full and partial normalisation of metabolic state within 1-Year post-bariatric surgery in Type 2 Diabetes Mellitus Patients using International Diabetes Federation criteria

Arameh Aghababae<sup>1</sup>, Rahila Bhatti<sup>2</sup>, Kathryn Waller<sup>3</sup>, Francesco Rubino<sup>3</sup>, Anthony Wierzbicki<sup>2</sup>, Abraham Botha<sup>3</sup>, Barbara McGowan<sup>2</sup>

<sup>1</sup>King's College London, London, UK, <sup>2</sup>Guy's and St. Thomas' Hospital, London, UK, <sup>3</sup>King's College Hospital, London, UK

**Background:** Bariatric surgery is becoming the mainstay of treatments for severe obesity, particularly when complicated by co-morbidities such as Type 2 Diabetes Mellitus (T2DM). Previous studies assessing remission of T2DM post-bariatric surgery have used parameters limited to HbA1c and fasting plasma glucose. The aim of this study was to assess the percentage of patients with T2DM achieving criteria for full and partial normalisation of metabolic state according to criteria set out by the International Diabetes Federation (IDF) within 1 year post-bariatric surgery.

**Methods:** In this retrospective study, data were collected on patients with T2DM who underwent gastric band (GB), gastric bypass (RYGB), and sleeve gastrectomy (SG) between March 2009 and December 2014. IDF targets for full normalisation of metabolic state are defined as: HbA1c  $\leq 6\%$ , no hypoglycaemia,

blood pressure  $< 135/85$  mmHg, weight loss  $> 15\%$ , total cholesterol  $< 4$  mmol/l, triglycerides  $< 2.2$  mmol/l, LDL  $< 2$  mmol/l, and a reduction in the number or dose of pre-operative medications. IDF targets for partial normalisation of the metabolic state are defined as: HbA1c reduction  $> 20\%$ , blood pressure  $< 135/85$  mmHg, LDL  $< 2.3$  mmol/l, and a reduction in the number or dose of pre-operative medications.

**Results:** 113 patients with T2DM underwent surgery but a full metabolic data set was only available on 68 patients and these were analysed in this study (24 GB, 15 RYGB, and 29 SG patients). The mean ( $\pm$ SD) age of the patients was  $53 \pm 7$  years and 59% were women. The mean pre-op BMI was  $49.2 \pm 8.1$  kg/m<sup>2</sup> and mean HbA1c was  $8.3 \pm 1.9\%$ . Within 12 months post-surgery, there were significant reductions in BMI to a mean of  $39.6 \pm 6.7$  kg/m<sup>2</sup> ( $p < 0.001$ ) and mean HbA1c to  $6.7 \pm 1.6\%$  ( $p < 0.001$ ). Within 12 months post-surgery, 28% ( $n = 19/68$ ; 3 GB, 7 RYGB, and 9 SG patients) achieved IDF criteria for full normalisation, and 22% (15/68; 5 GB, 2 RYGB, and 8 SG patients) achieved criteria for partial normalisation of the metabolic state; individual IDF targets for HbA1c, weight loss, BP, TC, TG, LDL, and pre-operative medications were attained by 59% ( $n = 40/68$ ), 73% ( $n = 46/63$ ), 85% ( $n = 58/68$ ), 60% ( $n = 41/68$ ), 93% ( $n = 63/68$ ), 63% ( $n = 43/68$ ) and 86% ( $n = 57/66$ ) respectively, within 12 months post-op.

**Conclusion:** 50% of patients undergoing bariatric surgery achieve full or partial normalisation of metabolic state within 12 months of surgery. A large proportion of patients achieved individual IDF targets within 1 year post-surgery. These results re-enforce the role of bariatric surgery as both a metabolic and weight-loss intervention.

## APS04

### Cases illustrating clinical use of combination of low energy liquid diets and GLP-1 analogues in patients with type 2 diabetes

Adrian Park, Joanna Hoensch, Claire Connell, Anita Sarkar

Obesity Clinic, Cambridge Universities Hospitals NHS Foundation Trust, Cambridge, UK

**Background:** Patients with type 2 diabetes and a BMI  $> 35$  kg/m<sup>2</sup> are encouraged to be considered for intensive lifestyle intervention and may also be eligible for the use of GLP-1 analogues. The Intensive Weight Management Programme (IWMP) is a 6 month obesity management programme incorporating a low energy liquid diet (LELD) with behaviour change strategies, physical activity guidance and appropriate obesity pharmacotherapy. It is used within a hospital multidisciplinary team (MDT) obesity clinic, with audit data showing a mean weight loss of  $13.2 \pm 1.0\%$ . Here we report on two cases of patients on the IWMP who have been used in conjunction with the GLP-1 analogue liraglutide.

**Methods:** Both patients had appropriate optimisation prior to starting the IWMP.

**Results:** Case (1): 61 year old male; Past medical History (PMH): Type 2 diabetes, Hypertension, Obstructive Sleep apnoea (OSA) on NIPPY, peripheral vascular disease and ischaemic heart disease; Medications: Aspirin 75 mg OD, Atorvastatin 40 mg OD, Bisoprolol 5 mg OD, Ezetimibe 10 mg OD, Furosemide 40 mg BD, Humalog mix 25 116 units BD, Losartan 100 mg OD, Metformin 1 g BD, Spironolactone 50 mg OD. Started IWMP 20/8/2013 (weight 145.8 kg, BMI 44.0 kg/m<sup>2</sup>, HbA1c 81 mmol/mol). During the 1<sup>st</sup> phase of the programme Liraglutide 1.2 mg od was started, Humalog Mix 25 232u stopped, Furosemide reduced by 50%, Spironolactone reduced by 50% and Orlistat started. Completed IWMP 17/3/2014 (weight 104.2 kg, BMI 31.5 kg/m<sup>2</sup> (41.6 kg/28.5% weight loss) HbA1c 54 mmol/mol, NIPPY discontinued). 26/11/2015-patient reported weight 100 kg remaining on liraglutide. Case (2): 42 year old female; PMH: Type 2 diabetes, Hypertension, Dyslipidaemia, OSA on CPAP, CKD stage III, SLE, Hypothyroidism; Medications: Liraglutide 1.2 mg OD, Thyroxine 225 µg OD, Aspirin 75 mg OD, Bendroflumethiazide 2.5 Mg OD, Rampril 10 mg Bd, Hydroxychloroquine 200 mg Bd, Doxazosin 4 mg OD, Omeprazole 20 mg OD, Simvastatin 20 mg OD, Gliclazide 160 mg Bd, Insulatard 38U OD, Azathiopine 200 mg OD. Started IWMP 25/6/2013 (weight 168.6 kg, BMI 55.0 kg/m<sup>2</sup>, HbA1c 104 mmol/mol). During 1<sup>st</sup> phase of programme insulatard was stopped, gliclazide stopped, bendroflumethiazide stopped, doxazosin stopped, orlistat started, azathiopine dose halved. 3month review (post completion) 4/3/2014 (Weight 118.4 kg, BMI 36.6 kg/m<sup>2</sup> (50.2 kg/29.9% weight loss), HbA1c 37 mmol/mol). 26/11/2015-patient reported stable weight until August



2014 when sleeve gastrectomy performed and subsequent reported weight gain of 12.7 kg).

**Conclusion:** These cases show that the combination of GLP-1 analogues in patients with type 2 diabetes on the IWMP can produce significant weight benefits in complex obese patients. Combinations of GLP-1 analogues and LELD with intensive lifestyle intervention may thus be very beneficial in patients not going forward for bariatric surgery.

## APS05

### A rare case of PICA syndrome post bariatric-surgery

Surya Panicker Rajeev, Padraig McQuaid, Anna Cowell, John Wilding

*Department of Obesity and Endocrinology, Aintree University Hospital, Liverpool, UK*

We report the case of a 35-year-old patient who had developed severe iron deficiency anaemia post bariatric surgery resulting in pica symptomatology. She had Roux-En-Y gastric bypass in August 2012 when she weighed 146 kg. She weighed 123.7 kg three months after the surgery. She did not have any post-operative complications and nutritional bloods including iron levels (iron levels 9 micromoles/L (normal 10–30 micromoles/L), iron binding capacity 68 micromoles/L (normal 40–70 micromoles/L), ferritin 63 micrograms/L (normal 14–275 micrograms/L) were satisfactory at this stage. She was on standard mineral and vitamin supplementation. Six months post-operatively, she lost further 13 kgs in weight. Nutritional bloods were satisfactory apart from slight iron deficiency of 9 micromoles/L with Iron binding capacity of 72 micromoles/L. Her haemoglobin level however was at the top end of normal at 158 g/land she was systemically well. Hence she was not started on iron supplements. Nine months after the surgery, she weighed 102.5 kg. Her nutritional bloods now showed zinc deficiency (Zn level 9.1), low B12 levels (146 nanograms/L) and low folate levels (4.5 micrograms/L). Iron levels were normal. She was started on zinc and folate supplements as well as B12 injections. She remained clinically stable with continuing weight loss. She was reviewed in clinic in October 2014 when she had problems with hypoglycaemia and consequent weight gain (weight 109.4 kg). An oral glucose tolerance test confirmed diagnosis of reactive hypoglycaemia and dietary modification was advised, which resulted in improvement in these symptoms. She was reviewed in clinic in January 2015 (weight 111.3 kgs). At this stage, she had developed pica, which manifested as eating cotton or thread from her own clothes or around the house – this was manifest with large holes in the t-shirt that she wore to clinic; she recognised this was abnormal, but reported that she found it impossible to resist this behaviour. Biochemical investigations at this stage showed haemoglobin levels of 112 gm/l. She was severely iron deplete at 3.0 micromoles/L and ferritin and folate were low at 6.0 microgram/L and 4.2 microgram/L respectively. She was referred for clinical psychology input. She was immediately started on ferrous sulphate tablets. She was treated with intravenous iron (Cosmofer, 1000mg), given her persistent and compulsive craving for non-food items. She reported complete resolution of pica symptoms after the iron infusions. Her latest haemoglobin, iron and ferritin levels are 138 micrograms/L, 11 micromoles/L and 105 micrograms/L respectively and she remains well.

Pica is an eating disorder, which causes persistent ingestion of non-food items at an age when this is considered to be an inappropriate behaviour and can be associated with iron, zinc and copper deficiency. The precise pathophysiology of pica or its association with nutritional deficiencies is unknown. Patients can consume non-food items like ice, laundry starch (as in our case) or soil clay and the last two can bind iron in gastrointestinal tract exacerbating iron deficiency. This can also interfere with the consumption of normal nutritious food. Treatment of nutritional deficiencies often resolves symptoms. However, a multi-disciplinary approach involving physician, dietician and clinical psychologist is important.

## APS06

### The Ambulatory Glucose Profile (AGP), a new tool in the diagnosis and management of severe reactive hypoglycaemia post bariatric surgery?

Eveleigh Nicholson, Lorraine Albon

*Portsmouth Hospital NHS Trust, Portsmouth, UK*

**Background:** Severe hypoglycaemia post Roux-en-Y gastric surgery is well documented. This male patient had surgery age 37. Seizures had started 3 years post op and were assumed to be due to severe hypoglycaemia after cardiac and neurological causes were excluded and low blood glucose readings were obtained on home monitoring. Treatment rapidly escalated to a combination of diosoxide and octreotide, despite which disabling symptoms persisted. Reproducing these episodes allowing laboratory confirmation of diagnosis was challenging with extended oral glucose tolerance test and mixed meal test failing to produce hypoglycaemia.

**Method and Results:** A Freestyle Libre sensor was applied and used for 2 weeks, initially with a low carbohydrate diet, then an unrestricted diet. The AGP showed marked glucose excursions post prandially with associated severe re-bound hypoglycaemia. During restricted diet times these were not evident but were uncovered on re-introduction of carbohydrates, despite continued medical therapy. AGP also showed considerable variability day-to-day in blood glucose levels. The patient was admitted to hospital and allowed to eat and exercise freely, producing a hypoglycaemic event that allowed lab analysis showing serum glucose 2.4, pro-insulin 43.0, insulin 14.7 and c-peptide 4733.0, confirming inappropriate endogenous insulin production.

**Conclusions:** Reactive hypoglycaemia post bariatric surgery is not a benign condition having severe implications for this patient in terms of health and lifestyle. AGP has been used in this case to help confirm the aetiology and to allow the patient to understand the effect of carbohydrate ingestion on blood glucose levels in real time. The AGP has shown the variability in blood glucose readings particularly in waking hours as well as the glucose excursions associated with food, despite the patient not being diabetic. In combination with lab results, severe hypoglycaemia has been proven, and the patient is now considering reversal surgery in the hope of ameliorating his symptoms.

## APS07

### Differences in anthropometric and metabolic parameters between subjects with hypoglycaemia and subjects with euglycaemia after an oral glucose tolerance test six months after laparoscopic sleeve gastrectomy

Dimitris Papamargaritis<sup>1</sup>, Eleni Sioka<sup>2</sup>, Eleni Zachari<sup>2</sup>, Alexandra Bargiota<sup>3</sup>, Dimitris Zacharoulis<sup>2</sup>, George Tzouvaras<sup>2</sup>

<sup>1</sup>Leicester Diabetes Centre, Leicester, UK, <sup>2</sup>Department of Surgery, University Hospital of Larissa, Larissa, Greece, <sup>3</sup>Department of Endocrinology, University Hospital of Larissa, Larissa, Greece

**Background:** Hypoglycaemia after an oral glucose tolerance test (OGTT) can occur in up to 33% of subjects after laparoscopic sleeve gastrectomy (LSG). The underlying pathophysiology is not well understood. We aimed to compare the anthropometric and metabolic characteristics of subjects with post-OGTT hypoglycaemia (HYPO) six months after SG to subjects with post-OGTT euglycaemia (EU).

**Methods:** Eighteen (15 women) morbidly obese patients with normal glucose tolerance (NGT) were evaluated with a 2 hour Oral Glucose Tolerance Test (OGTT) before and 6 months after LSG. Serum glucose and insulin were measured before and every 30 min after the ingestion of 75 g of glucose up to 120'. The patients were categorised as HYPO or EU based on lowest glucose levels at 90' to 120' post-OGTT 6 months after LSG (hypoglycaemia was defined as glucose levels  $\leq 60$  mg/dl). OGTT derived indices of insulin secretion, insulin sensitivity and beta cell function were calculated.

**Results:** 44.4% (8/18) of patients were categorised as HYPO. Preoperatively, subjects with HYPO had lower BMI ( $p=0.02$ ) compared to EU. Both groups lost similar weight postoperatively and subjects with HYPO had lower BMI ( $p=0.01$ ), lower weight ( $p=0.01$ ) and higher % total weight loss (%TWL) ( $p=0.03$ ) compared to EU. The beta cell function postoperatively [Oral Disposition Index (ODI) (0–120)] was increased in the HYPO group compared to EU ( $p=0.02$ ). Six months after LSG, glucose levels measured as area under the curve (AUC) (0–120) were lower in the HYPO group compared to the EU group ( $p=0.04$ ). No difference was detected in insulin levels measured as insulin AUC (0–120) as well as in insulin secretion and insulin sensitivity indices between the two groups preoperatively or postoperatively.

**Conclusion:** NGT subjects who developed HYPO six months after LSG are “leaner”, with higher TWL% and increased beta cell function compared to NGT subjects with EU.

## APS08

### **Pityriasis Rubra Pilaris, Protein Energy Malnutrition and Micronutrient Deficiency: Emerging problems of Bariatric Surgery**

**Shoib Rehman, Mie Mie Tisdale, Tara Wallace, Anne-Marie Skellett, Khin Swe Myint**

*Norfolk and Norwich University Hospital, Norwich, UK*

**Background:** Gastric Bypass Surgery (GBS) is an essential treatment option for obesity and their comorbidity. Lifelong follow up for nutrition is a crucial part of post-op management.

**Methods:** We present a 44-year-old patient who admitted to hospital with Itching rash, generalised weakness and Diarrhoea. She had a background history of type 2 Diabetes, Arnold Chiari malformation requiring VP shunt, Idiopathic Intracranial hypertension and GBS 10 years ago. Her symptoms were initially attributed to a potential drug reaction. She was then re-admitted twice with collapse, pneumonia, hypoxia and bilateral pleural effusion. Only on the third admission, future history revealed that she lost follow up for her GBS 3 years after the operation. She has lost a total of 75 kg body weight (weight on admission 60Kg, BMI 24 kg/m<sup>2</sup>).

**Investigations:** indicated gross deficiency of protein (Albumin 15 g/l), electrolytes (potassium 3 mmol/l, Magnesium 0.61 mmol/l) Vitamins (Vitamin A- 0.3µmol/mol R: 1.4-3.8, Vitamin D- 22 nmol/l) and key minerals (Selenium 0.29 mmol/mol R: 0.8-1.4, Zinc 5 nmol// R:11–24). HbA1c 36 mmol/mol and fasting glucose of 5.4 mmol/l. Skin biopsy showed orthokeratosis and parakeratosis which lead to the diagnosis of pityriasis Rubra Pilaris; a rare papulosquamous inflammatory dermatosis which can be attributed to Vitamin A deficiency although the link is not well established.

**Results:** Treatment with Actitrentin (Synthetic Vitamin A Derivative) show dramatic improvement of cutaneous lesions. The rest of the nutrition, Vitamins and mineral were also carefully replaced. Metformin and acetazolamide were stopped. She had a prolonged hospital stay and discharged home with a detail follow up plan. Unfortunately, she was readmitted 3 weeks with severe electrolyte disturbances and died shortly after admission.

**Conclusions:** Pityriasis Rubra Pilaris was likely linked to her Vitamin A deficiency. Cutaneous lesions can be the first presentation of severe malnutrition. Normal BMI in postoperative patients does not exclude malnutrition. Medication needs re-evaluating in all post GBS patients. The pitfalls in management of this patient highlight the importance of post bariatric follow up, awareness nutrition deficiency in GBS by general practitioners and general physicians. Educating patients and health care professionals, reinforcement of BOMSS guidelines are paramount to prevent similar tragic event.

## Session 7: Parallel - DVD

Friday 29 January 2016 (08:30–10:00)

### D01

#### **Band-Preserving Mini Gastric Bypass**

**Naim Fakhri Gomez, Derek Yeung, Rosie Byars, Ahmed Ahmed**

*Imperial College London, London, UK*

**Background:** Revisional surgery for weight regain after gastric banding includes many options, one of them is preserving the band and performing a mini gastric bypass.

**Methods:** We report the clinical case of a 47-year-old woman who underwent a laparoscopic gastric band insertion for obesity in 2012. Her preoperative BMI was 35 kg/m<sup>2</sup>. Her main related comorbidities included hypertension and dyslipidemia. She managed to lose weight initially but regained the weight afterwards. The patient sought further surgery but wanted her band preserved.

**Results:** The patient underwent a mini gastric bypass preserving the previous band in place. The band was defilled preoperatively. The vertical pouch was fashioned lateral to the band. A standard mini gastric bypass was performed afterwards with 200 cm afferent limb. The patient tolerated the procedure well and was discharged home in the second postoperative date without any complications. She did not have any particular morbidity during the first month after her operation.

**Conclusion:** A mini gastric bypass is a good option for revisional surgery for a gastric band especially if the band is kept in place. It is a feasible option and avoids an anastomosis close to the band. It may also reduce the risk of bile reflux symptoms related to mini gastric bypass.

### D02

#### **Hiatus hernia repair with fixation of oesophagus in Sleeve Gastrectomy – how I do it?**

**Kesava Reddy Mannur, Umesh Parampalli, Adam Goralczyk**

*Homerton University Hospital, London, UK*

**Background:** Gastro oesophageal reflux can be debilitating in patients who had Sleeve Gastrectomy SG if there is hiatus hernia. The question is whether it has to be repaired at the same time? There is a lot of controversy about it.

**Methods:** All the patients who had SG had the hiatus hernia repaired at the same time. We have looked at the results of the previous few years. We explain how the repair of the hiatus hernia is evolved and why. Initially the hiatus hernia alone was repaired. Then the oesophageal fixation or Fundus fixation to crus was added. We describe the video presentation of the hiatus hernia which is initially not seen but became more apparent as the dissection of the fundus and the crus video is done. The video demonstrates how the hiatus hernia is repaired and then the oesophagus is fixed to the crus.

**Results:** In the patients where the hiatus hernia was only repaired but not the oesophageal fixation, the stomach migrated partly into mediastinum and had GORD and have to be either the hiatus hernia repair was done again with oesophageal fixation, or converted to Gastric bypass in persons with severe reflux. In the patients where the Oesophageal fixation was also performed, there was no migration of the stomach and no reflux problems.

**Conclusion:** Hiatus hernia has to be sought out even if it is not evident on initial laparoscopy. Then the hiatus hernia has to be repaired along with fixation of the oesophagus and or fundus to the crus to prevent migration of stomach into chest when the weight loss and reduction of fat occurs.

### D03

#### **Sleeve Gastrectomy to Gastric Bypass in a hostile abdomen with an ileal Conduit**

**Umesh Parampalli, Adam Goralczyk, Anupam Dixit, Kalpana Devalia**

*Homerton University Hospital, London, UK*

**Background:** Conversions of sleeve gastrectomy, SG to Roux-en-Y gastric bypass, RYGB are required for stricture, fistula, weight regain and most commonly severe gastro-oesophageal reflux disease, GORD. We describe one such case with an ileal conduit posing a surgical challenge.

**Methods:** 50 year old lady had an ileal conduit for a congenital urinary bladder anomaly. She initially had a SG but later developed severe GORD symptoms which necessitated a revision to gastric bypass. Supine position with legs in stirrups and arms extended and abducted. Pneumoperitoneum established by Veress needle insufflation via left upper quadrant. 12 mm port placed 20 cm below xiphoid process in midline, further two 12 mm ports are placed along right and left midclavicular line in line with pylorus. A liver retractor is placed below the xiphisternum and a 5 mm assistant port is placed in the left anterior axillary line. A diagnostic laparoscopy showed dense adhesions and grossly shortened small intestine required to construct a RYGB. Ultrasonic dissector and diathermy are used to perform careful adhesiolysis. Vertical gastric pouch is created using Covidien TriStaple™ stapler. Omentum is split and biliopancreatic

limb is measured upto 100 cm and anastomosed to the posterior gastric pouch using linear TriStaple™ stapler. Alimentary limb is measured upto 120 cm and a jejunojunostomy is performed using single linear TriStaple™ stapler and hand suturing. Mesenteric defect is closed using Prolene.

**Conclusion:** Meticulous adhesiolysis following tissue planes is the key to revisional bariatric procedures. It is a challenge to obtain adequate length of bowel required for both limbs of RYGB as shown in this case.

## D04

### Obesity associated with Massive Pannus: Simultaneous Abdominoplasty and Gastric Bypass

Derek Yeung, Naim Fakhri Gomez, Shaima Jamshidi, Adam Topping, Ahmed Ahmed

*Imperial College London, London, UK*

**Background:** Massive excess skin can be associated to obesity. It may be the origin of medical comorbidities, such as intertrigo and functional disabilities, in addition to its devastating psychosocial impact. Although a simultaneous procedure with bariatric surgery in one operation is preferable for the patient and is more cost-effective, it is related to higher morbidity.

**Methods:** We report the case of a 67-year-old woman with a BMI of 64 kg/m<sup>2</sup> (weight 170 kg). Her main comorbidities included type 2 diabetes mellitus, hypertension, hypercholesterolemia, chronic renal disease, and obstructive sleep apnoea. She also has got a huge external pannus which is impairing her mobility and is giving her severe back pain resulting in a devastating effect on her quality of life. Preoperatively, she had an IVC filter inserted because of high risk of thromboembolism.

**Results:** In combination with plastic surgery, the patient underwent an abdominoplasty excising 27 kg of pannus, followed by a laparoscopic roux-en-y gastric bypass with a 100 cm alimentary limb. Despite her comorbidities, the patient tolerated the procedure well and was discharged home without any complications. She did not have any particular morbidity during the first 2 months after her operation.

**Conclusion:** Abdominoplasty can be a feasible and safe approach in combination with bariatric surgery in properly selected patients and carefully optimized prior to their surgery in a multidisciplinary team approach.

## D05

### Staged Management of an Early Sleeve Gastrectomy Leak: Laparoscopic Use of a Roux Limb as Remedial Surgery for a Sleeve Gastrectomy Fistula

Chris Pring, Will Hawkins, I Maheswaran, Guy Slater

*St Richard's Hospital, Chichester, UK*

**Background:** Sleeve gastrectomy leaks are a challenging management problem

**Methods:** This edited video highlights the essential management steps in managing an early leak (day 32) following a sleeve gastrectomy.

**Results:** Staged management involved treating the sepsis, establishing enteral nutrition, defining the anatomy and then laparoscopically anastomosing a roux limb onto the fistula. All steps are covered in this edited video. The patient made an uncomplicated recovery

**Conclusion:** Staged management of an early sleeve gastrectomy leak by eventual formation of a roux loop onto the fistula is possible laparoscopically.

## D06

### Gastric Bypass after Nissen's Fundoplication for Recurrent GORD in Obese Patient

Naim Fakhri Gomez, Derek Yeung, Christos Tsironis, Ahmed Ahmed

*Imperial College London, London, UK*

**Background:** Nissen's fundoplication is considered the standard surgical treatment of GORD. In normal weight individuals, this is a very effective option in controlling reflux symptoms. On the other hand, morbidly obese patients are four times more likely to experience recurrence of acid reflux symptoms after a fundoplication.

**Methods:** We present a case of a 62 year-old gentleman with a BMI of 36 kg/m<sup>2</sup> and a background history of type II diabetes mellitus, hypertension and gastro-oesophageal reflux disease and who underwent laparoscopic Nissen's fundoplication two years ago. He had recurrent symptoms of GORD and non-responsive to optimal medical treatment. Barium swallow showed significant reflux. A decision was therefore made to perform a laparoscopic Roux-en-Y gastric bypass.

**Results:** The operation was achieved laparoscopically. After adhesiolysis, the plication sutures were cut and complete mobilization performed for takedown of the plication freeing it completely from its retroesophageal pathway. A standard RYGB was then performed. A subtotal gastrectomy of the gastric remnant fundus was performed due to the lack of vascularization of the fundus. The patient tolerated the procedure well and was discharged home with no short-term complications. The procedure controlled his GORD symptoms as well as achieving weight loss and diabetes control.

**Conclusion:** RYGB should be considered as an excellent option after fundoplication surgery in obese patients with recurrent GORD symptoms. Along with the advantages of weight loss, it is a method of resolving these symptoms. Although this is a challenging operation and technically demanding, it can result in good long term results and benefits for the patients.

## D07

### Laparoscopic Fundoplication Takedown with Conversion to Roux-En-Y Gastric Bypass

Umesh Parampalli, Adam Goralczyk, Anupam Dixit, Kalpana Devalia, Kesava Reddy Mannur

*Homerton University Hospital, London, UK*

**Background:** Laparoscopic fundoplication conversion to Laparoscopic Roux-en-Y gastric bypass, LRYGB is commonly performed as weight loss procedure and also to prevent gastro-oesophageal reflux. We demonstrate on such procedure done at our institution.

**Methods:** A 48 year old lady with a body mass index, BMI of 47.1 and a weight of 142 kilograms was contemplated for the conversion surgery. The lady has had repair of a large hiatus hernia and concomitant fundoplication 3 years ago. Supine position with legs in stirrups and arms extended and abducted. Pneumoperitoneum established by Veress needle insufflation via left upper quadrant. 12 mm port placed 20 cm below xiphoid process in midline, further two 12 mm ports are placed along right and left midclavicular line in line with pylorus. A liver retractor is placed below the xiphisternum and a 5 mm assistant port is placed in the left anterior axillary line. The 360 degree fundal wrap was completely undone after careful adhesiolysis using ultrasonic dissector and diathermy dissection. Vertical gastric pouch was created using Covidien Tristaple™ Endo GIA stapler. The fundus was appearing non-viable due to previously divided short gastric arteries. Hence partial fundectomy was performed. Omentum is split and biliopancreatic limb is measured up to 100 cm and anastomosed to the posterior gastric pouch using linear EndoGIA™ stapler. Alimentary limb is measured up to 150 cm and a jejunojunostomy is performed using single linear Tristaple™ Endo GIA stapler and hand suturing. Mesenteric defect is closed using prolene.

**Conclusion:** Meticulous adhesiolysis following poorly defined tissue planes is the key to revisional bariatric procedures. Careful unwrapping is required to prevent injury to oesophagus. Resection of fundus is essential as leaving behind an ischaemic fundus would risk ischaemic perforation postoperatively.

## D08

### The Band on Bypass (BoB) as a salvage procedure for weight regain after RYGB – technical tips

Andrew Harris, Charlotte Harper, Shafiq Javed, David Kerrigan

*Phoenix Health, Chester/Liverpool, UK*

**Background:** The Band on Bypass (BoB) procedure is a useful tool in helping to arrest or reverse weight regain due to pouch or GJ anastomotic dilatation following RYGB.

**Methods:** This video uses animation and live operation footage to demonstrate the technique of the BoB procedure.

**Results:** An accompanying abstract outlining the clinical medium-term results of the BoB procedure has been submitted to the meeting.

**Conclusion:** The BoB procedure is a simple and safe salvage treatment for weight regain after RYGB.

## D09

### Insertion of Bio-A Biosynthetic Mesh for Reinforcement of Hiatus Hernia Repair during Laparoscopic Sleeve Gastrectomy for Obesity

Andrei Ilcyszyn, Mohammed El Kalaawy, Marco Adamo

University College Hospital, London, UK

**Background:** A 38 year old lady with weight of 119kg was listed for laparoscopic sleeve Gastrectomy. Her comorbidities included PCOS and mild gastro-oesophageal reflux symptoms which did not require any regular anti-acid medication. At laparoscopy a hiatal defect was identified and repaired. We demonstrate a technique for the reinforcement of a hiatus hernia repair using the Bio-A biosynthetic absorbable onlay mesh during laparoscopic sleeve gastrectomy.

**Methods:** A 5-port pneumoperitoneum was undertaken with optical port entry. The greater curve vasculature was dissected with free with Thunderbeat (Olympus KeyMed Ltd., Southend, UK) 6 cm from the pylorus proximally to the angle of His. The gastro-oesophageal junction was dissected circumferentially and the right and left crura exposed. An aberrant left hepatic artery was preserved. The hiatal defect was repaired with interrupted anterior 2–0 Ethibond (Johnson & Johnson Medical Ltd., Livingstone, UK) sutures. The hiatal repair was reinforced with a 10x7cm BioA mesh (W. L. Gore & Associates (UK) Ltd, Livingstone, UK) which was cut to an inverted U shape to fit the hiatus. This was secured to the hiatus with multiple interrupted 2–0 Vicryl sutures (Johnson & Johnson Medical Ltd., Livingstone, UK). The sleeve gastrectomy was performed with multiple firings of a linear stapler (Ethicon etc.) with Seamguard (W. L. Gore & Associates (UK) Ltd, Livingstone, UK).

**Conclusions:** Hiatus hernia often occurs during laparoscopic sleeve Gastrectomy. Reinforcement with onlay Bio-A biosynthetic mesh is a useful technique to augment the repair of hiatus hernia detected at laparoscopic sleeve gastrectomy.

## Session 7: Free Paper Session - Surgical and AHP

Friday 29 January 2016 (08:30–10:00)

## E01

### The final nine outcomes selected by clinicians and patients for the first core outcome set for bariatric surgery – the BARIACT project

Karen Coulman<sup>1</sup>, James Hopkins<sup>2</sup>, Sara Brookes<sup>1</sup>, Katy Chalmers<sup>1</sup>, Noah Howes<sup>1</sup>, Katie Whale<sup>1</sup>, James Byrne<sup>3</sup>, Richard Welbourn<sup>2</sup>, Amanda Owen-Smith<sup>1</sup>, Alex Nicholson<sup>1</sup>, Jelena Savovic<sup>1</sup>, Jane Blazeby<sup>1</sup>

<sup>1</sup>School of Social and Community Medicine, University of Bristol, Bristol, UK, <sup>2</sup>Taunton and Somerset NHS Foundation Trust, Taunton, UK, <sup>3</sup>Southampton University Hospitals NHS Foundation Trust, Southampton, UK

**Background:** Systematic reviews of clinical and patient-reported outcomes currently being used to evaluate bariatric surgery identified over 3000 individual outcomes. This means that findings from different studies cannot be combined and this limits our ability to make informed decisions for patients. To address this we need a minimum core outcome set (COS) to be reported in all future clinical trials of bariatric surgery. We aimed to develop a COS for bariatric surgery using clinician and patient input – the BARIACT project.

**Methods:** We conducted systematic reviews and qualitative interviews with patients to list all outcomes of bariatric surgery. We then created a 130-item questionnaire for a Delphi survey with clinicians and patients. The survey included three rounds, where participants rated the importance of each item on a 1 to 9 scale. Results of each round were fed back in the subsequent round, and participants re-rated each item in light of this feedback. We classed items rated 8–9 by  $\geq 70\%$  of participants in round 3 as ‘very important’, and carried them forward for discussion and voting at two separate consensus meetings with clinicians and patients. All items voted in by  $\geq 70\%$  of participants were kept in for the final COS.

**Results:** 168 clinicians and 90 patients completed survey round 1, of whom 76% and 90% completed round 2, and 85% and 89% completed round 3. Clinicians and patients rated 35 questionnaire items as ‘very important’ after round 3. These were carried forward to the consensus meetings, held with 33 clinicians and 8 patients. Clinicians and patients unanimously voted for 8 items: ‘Weight’, ‘Improvement in diabetes’, ‘Quality of life’, ‘Mortality (30-day or long-term)’, ‘Technical complications of the specific operation’, ‘Any re-operation/re-intervention and its classification of severity’, ‘Dysphagia/regurgitation’, and ‘Problems with micronutrient levels’. Clinicians also voted in a 9<sup>th</sup> item: ‘Reduction in cardiovascular risk’.

**Conclusion:** We have developed a COS for bariatric surgery, containing nine ‘core’ outcomes. This is an important first step in standardising what is measured in potentially all future clinical trials of bariatric surgery. We will now validate the COS internationally, and undertake further work to determine how each of the outcomes should be measured.

## E02

### The yield of computed tomography post laparoscopic gastric bypass, does it worth doing?

Numan Hamza, Ahmad Al Samaraee, Chetan D Parmar, William Carr, Peter Small

Sunderland Royal Hospital, Sunderland, UK

**Background:** Computed tomography (CT) is a common modality used to investigate potential complications post bariatric surgery. The aim of this project was to appraise the use and the yield of CT post laparoscopic gastric bypass (LGBY).

**Methods:** All cases of LGBY carried out at our institute between October 2012 and October 2014 were reviewed and scrutinised. CTs were divided into two groups; those carried out within 1 month to rule out early complications, and those performed 1 month or later to exclude late complications. The data are presented as median (range).

**Results:** The age and a preoperative body mass index were 47 (20–74) years and 43 (31–69) kg/m<sup>2</sup>, respectively, of 772 consecutive patients (585 female) who underwent LGBY. At a follow up of 25 (12–37) months, 90/772 (11.7%) patients underwent 111 CTs postoperatively (74 female). Ninety patients underwent 1 CT, 13 patients had 2 CTs, and CT was carried out on 3 or more occasions in 8 patients. In the early CT group, 34 patients underwent first CT at 3 (1–14) days postoperatively to look for early complications, however, only in 3/34 (9%) patients the CT showed an abnormality (liver laceration, haematoma, & internal hernia). In the late group, the first 56 CTs were carried out at 6 (1–19) months after surgery, the main indications were to exclude internal hernia ( $n = 27$ ), abdominal pain ( $n = 18$ ), other indications ( $n = 11$ ). Similar to the early CTs, the yield of the late ones was low at 11% (6/56 patients), identifying LGBY-related complications in only 2 patients (internal hernia with perforation and a collection), while 4 patients had unrelated pathologies. Of all the patients who have had first CT scan (90 patients), 33 patients (37%) underwent upper gastrointestinal endoscopy examination(s) as well to investigate their symptoms.

**Conclusion:** The overall gain of CT in the identification of complications post LGBY is low at 10%. This needs to be taken into consideration when investigating patients post bariatric surgery, and in the rationing of our resources.



## E03

**Cholesterol efflux in obesity related type 2 diabetes: Effects of glucose and ghrelin**

Rachel Churm<sup>1</sup>, Jon Barry<sup>2</sup>, Scott Caplin<sup>2</sup>, Nia Eyre<sup>2</sup>, Jeffrey Davies<sup>3</sup>, Jeffrey Stephens<sup>2</sup>

<sup>1</sup>Diabetes Research Group, Swansea University, Swansea, UK, <sup>2</sup>Welsb Institute of Metabolic & Obesity Surgery, Morriston Hospital, Swansea, UK, <sup>3</sup>Molecular Neurobiology Research Group, Swansea University, Swansea, UK

**Background:** ATP binding cassette subfamily G1 (ABCG1) is involved in mediating cholesterol efflux and modulating cellular lipid homeostasis. Its transcription is regulated by a cholesterol sensor family, liver X receptors (LXR $\alpha$ ), and influenced by endogenous glucose and the orexigenic peptide ghrelin. Our aim was to examine the expression of genes involved in this pathway in samples obtained from non-obese (N), obese (O) and obese subjects with Type 2 diabetes (ODM).

**Methods:** RNA was extracted from visceral fat collected from subjects undergoing abdominal surgery (bariatric and routine non-acute, non-malignant conditions). 15 subjects were categorised as N (n=5), O (n=5) or ODM (n=5). Samples were examined using Real-Time qPCR and 2- $\Delta\Delta$ Ct data analysis in order to determine gene expression changes.

**Results:** All three subject groups were well matched with weight/BMI being the only significant differences between clinical parameters. Results of O compared to N showed a significant increase in the expression of ABCG1 and LXR $\beta$  genes (ABCG1=5.5-fold increase; LXR $\beta$ =8.0-fold increase). Reduced expression of these genes was observed in ODM compared to O (ABCG1=3.1-fold decrease; LXR $\beta$ =3.2-fold decrease). The expression of ghrelin remained unchanged between the groups.

**Conclusion:** Results suggest that the increased level of endogenous glucose in the ODM group due to the presence of type 2 diabetes (O vs ODM; 5.5(1.2) vs 6.8(1.9) mmol/L), may be causing a detrimental effect on cholesterol export. However this process appears to be independent of ghrelin expression levels. This lipid accumulation could lead to the development of atherosclerotic plaques and altered immune response. Further evaluation of this pathway may provide a new therapeutic avenue for the management of obesity-related complications.

## E04

**Comparison of outcomes of patients with and without Type 2 Diabetes before, 2 and 8 weeks after Sleeve Gastrectomy and its relation to weight loss at 26 Weeks**

Jenny Abraham<sup>1</sup>, Neha Shah<sup>1</sup>, Rasheed Rabi<sup>1</sup>, Jessica Lee<sup>1</sup>, Tom Barber<sup>3</sup>, Sudhesh Kumar<sup>3</sup>, Vinod Menon<sup>1</sup>, Milan. K. Piya<sup>2</sup>

<sup>1</sup>Coventry & Warwickshire Hospitals NHS Trust, Coventry, UK, <sup>2</sup>Institute of Digital Healthcare, University of Warwick, Coventry, UK, <sup>3</sup>Warwick Medical, University of Warwick, Coventry, UK

**Background:** Type 2 diabetes (T2DM) is often a predictor of poor surgical outcome. A large proportion of bariatric patients have T2DM, often poorly controlled, and insulin therapy makes weight loss more difficult in this population. The glycaemic improvements following laparoscopic sleeve gastrectomy (LSG) are not as immediate as following gastric bypass surgery, although hypoglycaemia is a risk when insulin is not adequately reduced.

**Aim:** To compare weight loss on pre-op VLCD, and 2 and 8 weeks post-LSG in patients with and without T2DM; and to assess if these correlated with excess weight loss (%EWL) at 26 weeks. To also assess glycaemia at 8 weeks post-LSG, and insulin requirements.

**Method:** All LSG operations performed May 2014–September 2015 in a single surgical centre had HbA1c and DM medications recorded at the start of the 2-wk pre-op VLCD and 8-wks post-LSG with more frequent weight and HbA1c measurements up to 26-wks.

**Results:** Eighty-three LSGs were performed, with age 49.2 $\pm$ 9.9 years (mean $\pm$ SD) and 73.5% female. 48% had T2DM, with no difference in the age or gender distribution of T2DM vs no DM or heaviest recorded BMI (51.0 $\pm$ 5.3 kg/m<sup>2</sup>). The %EWL on the pre-op VLCD was similar in both

groups and did not correlate with %EWL at 26 weeks. The %EWL during the 8-week post-op period was greater in patients with T2DM (19.6 $\pm$ 7.4% vs 15.9 $\pm$ 6.4%, P=0.02). However, there was no difference in total weight loss at 26 weeks (T2DM 49.8 $\pm$ 21.0% vs 47.4 $\pm$ 14.8%). In the T2DM group, the weight loss in the 2-week and 8-week post-op period positively correlated with %EWL at 26 weeks (R=0.6, P=0.01 and R=0.7, P=0.002, respectively). However, there was no such correlation in those without T2DM (R=0.15 and R=0.11, P=NS). Mean HbA1c reduced 8 weeks post-LSG (60.9 $\pm$ 22.5 vs 50.9 $\pm$ 15.6 mmol/mol, P=0.03). Insulin dose reduced by >60% in 91.9% of patients on insulin, but 73% were still on insulin 8 weeks post-LSG, with no severe hypoglycaemia. There were no post-op complications in either group, with similar lengths of stay.

**Conclusion:** Patients with T2DM had greater %EWL at 8 weeks post-LSG but not at 26 weeks, compared to those without T2DM. In T2DM, %EWL at 2 and 8 weeks post-LSG may predict longer-term weight loss. Insulin should be reduced but not stopped before pre-op VLCD and monitored after LSG, as 73% needed insulin 8 weeks post-LSG.

## E05

**Meta-analysis of ghrelin and peptide-YY levels after Roux-en-Y gastric bypass and sleeve gastrectomy**

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**Background:** There are conflicting findings following bariatric surgery and the changes on gut hormones. Studies demonstrate a reduction, no change or increased in ghrelin levels after Laparoscopic Roux and Y Gastric Bypass (LRYGB). There are suggestions that after gastric restrictive surgery such as vertical banded gastroplasty (VBG) or Gastric Band, ghrelin levels increase. We compared the effect of laparoscopic Roux-en-Y gastric bypass (LRYGB) and laparoscopic sleeve gastrectomy (LSG) on gut hormones

**Methods:** We performed a meta-analysis study of all published randomised controlled trials and quasi-randomised controlled trials comparing LRYGB and LSG, which were eligible for inclusion. Only Ghrelin and PYY levels were published in all three included RCTs. Data for weight, insulin, HOMA-R, Leptin, CKK, and GLP-1 levels were only provided in two of the papers and therefore meta-analysis of those variables was not possible. The primary outcomes were level of gut hormone at baseline, 6 months and 1 year after weight reduction surgery.

**Results:** As expected, there is no difference in Ghrelin levels at baseline between patients undergoing LRYGB and LSG. There is a statistically significant reduction in the Ghrelin levels after LSG compare to that of LRYGB after 3 months. This difference continues to 12 months. Although the PYY satiety hormone was lower after LSG compare to LRYGB after 3 months (p<0.0001), this difference was lost at 1 year (p=0.17).

**Conclusion:** The beneficial effects of bariatric surgery are still poorly understood, but are most likely to be multifactorial in etiology. Studies of peptide hormone concentrations after bariatric surgery have often found conflicting results. These results are important in understanding the probable mechanisms of different surgical procedures resulting sustained weight loss and better control of Diabetes.

## E06

**Laparoscopic sleeve gastrectomy versus Laparoscopic Roux-en-Y Gastric Bypass: A single centre experience with postoperative 2–5 years follow-up**

Peter Vasas, John Finney, Katie Kirk, Hammad Zaidi, Nehemiah Samuel, Srinivasan Balchandra

Doncaster Royal Infirmary, UK

**Background:** Laparoscopic Sleeve Gastrectomy (LSG) is a relatively new procedure that is gaining wide acceptance. However, laparoscopic Roux-en-Y Gastric Bypass (LRYGB) remains the gold standard of the bariatric procedures with the best long-term results. The aim of this study is to compare the safety and outcome of LSG to LRYGB in a single centre.

**Methods:** Retrospective analysis of the prospectively developed departmental database was performed. All consecutive stapled procedures were reviewed and involved, between June 2010 and Sept 2013, allowing at least 2 years follow-up. LSG was performed using a 38 F bougie, while LRYGB was performed with the hand-sewn technique. The primary outcomes included 30-day complication and readmission rates and excess weight loss (% EWL) at 12 and 24 months postoperatively. Co-morbidity resolution was examined at 24 months postoperatively.

**Results:** A total of 162 patients were included in our analysis. 127 patients underwent LRYGB (78%) and 35 underwent LSG (22%), with the initial BMI of 50.9 and 52.4 kg/m<sup>2</sup>, respectively. Thirty-day complication rates for LRYGB and LSG were (10.2% and 2.9%,  $p < 0.05$ ), and the thirty-day readmission rates were 4.7% and 2.9%, respectively. %EWL for LRYGB was significantly higher than LSG at 12 and 24 months (68.1% and 67.8% vs 45.8% and 43.7%). According to the American Diabetes Associations guidelines, complete diabetes remission was achieved 31/50 patients in the LRYGB group (62%), and 2/9 patients (22%) in the LSG group. 17/18 patients (94%) in LRYGB group has stopped using the CPAP-machine to treat their obstructive sleep apnoea, and this found in 7/12 patients (58%) in the LSG group.

**Conclusion:** LSG seems to have a better safety profile in the short-term compared to LRYGB. However, at 2 years, LRYGB patients achieved a significantly higher EWL compared to LSG patients, and the comorbidity remission rate in the LRYGB group supersedes the LSG rate. Our suggested weight loss method remains the LRYGB.

## E07

### Pregnancy after obesity surgery

Katie Cornthwaite<sup>1</sup>, Amanda Jefferys<sup>1</sup>, Erik Lenguerrand<sup>2</sup>, Anne Haase<sup>2</sup>, Mary Lynch<sup>1</sup>, Andrew Johnson<sup>1</sup>, Tim Draycott<sup>1</sup>, Dimitrios Siassakos<sup>1</sup>

<sup>1</sup>North Bristol NHS Trust, Bristol, UK, <sup>2</sup>University of Bristol, Bristol, UK

**Background:** The current obesity epidemic and its negative effects on maternal and perinatal outcomes pose a serious challenge to maternity services across the UK. Although women are increasingly undergoing weight loss surgery, there is a paucity of evidence evaluating the effect on pregnancy.

**Methods:** We summarise three recent UK studies evaluating pregnancy outcomes after weight loss surgery: (1) National cohort study of pregnancy after Laparoscopic Adjustable Gastric Banding (LAGB). Data collected using established surveillance system (UKOSS) over 1 year. Outcomes compared according to band management (band inflation maintained vs. deflation), and with national birth data. (2) Ongoing national cohort study of women pregnant after gastric bypass surgery (same methodology). (3) Qualitative study exploring women's experience of pregnancy following LAGB (ENGAGE)

**Results:** In one year, 127 women were pregnant following LAGB. Band management was equally divided: 50.5% had band inflation maintained. Inflation was associated with reduced gestational weight gain, improvement of some maternal outcomes such as gestational hypertension, but a worsening of some perinatal outcomes including low birth weight. Data collection is ongoing for the study of pregnancy following gastric bypass surgery, however, similar numbers of pregnancies following bypass surgery compared with LAGB have been identified. Preliminary analysis of the ENGAGE qualitative data suggests limited information, guidance and support in pregnancy, and need for clarity regarding band management during pregnancy.

**Conclusion:** Pregnancy after obesity surgery remains high risk. We advocate multi-professional care with pre-pregnancy counselling, discussion of associated risks, and close monitoring of maternal and fetal wellbeing. Further analysis will evaluate the impact of time from surgery to conception on pregnancy outcomes, and allow comparison of maternal and perinatal outcomes between LAGB and bypass surgery. Emerging evidence will inform a consensus for the management of these complex pregnancies, and facilitate the development of platforms providing improved information and support for women.

## E08

### Is laparoscopic port site closure required after bariatric surgery?

Jeremy Gilbert, Ian Finlay, Michael Clarke, Allwyn Cota, Bridie Kent

Royal Cornwall Hospital, Truro, Cornwall, UK

**Background:** Laparoscopic port site hernia is a recognised complication of laparoscopic surgery, with obesity identified as a risk factor. It has been suggested that closure of the laparoscopic port site fascial layer may reduce hernia rates but it can be difficult to perform for bariatric surgery patients. It has also been suggested that if dilating bladeless trocars are used, fascial closure is unnecessary. This study aimed to examine port site incisional hernia rates post bariatric surgery performed using dilating bladeless trocars without fascial defect closure.

**Methods:** All patients who underwent laparoscopic bariatric surgery between July 2009 and December 2013 at a single centre were included in the study. Bladeless dilating trocars were used for all port sites without fascial closure. All patients underwent routine post operative follow up including examination of port sites. A prospectively recorded complication log and all patients' case notes were retrospectively examined to identify cases of incisional hernia.

**Results:** 291 operations were performed (95 gastric band, 168 bypass, 14 Sleeve gastrectomy, 14 laparoscopy), via a total of 1455 port site incisions (537 × 5 mm, 826 × 12 mm, and 95 × 15 mm). BMI mean = 45.62 (range 34.2 – 66.3), 250 females. Mean length of follow up = 23.32 months (0 – 63 months). One patient (0.34%) developed an incisional hernia at a 12 mm port site (0.12% of all 12 mm port sites). There were no other port site related complications

**Conclusion:** The hernia rate observed is not significantly different to reported hernia rates for bariatric patients in whom port sites were closed (range 0.14% – 1%,  $p \geq 0.4$  Chi Square test). Not closing the incision site of a dilating bladeless trocar of sizes 5 to 15 mm is safe and does not result in an increased rate of incisional hernia formation.

## Posters

### Thursday 28 – Friday 29 January 2016

## PoD1

### In situ infection of Intra-gastric balloons - Case Report

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**Background:** Intra-gastric balloons (IGB) have become a well-established tool in aiding weight loss prior to definitive surgery. We have used IGB in our unit for 5 years and have placed in excess of 200. We present two cases of IGB infection causing massive balloon dilation necessitating emergency removal. To our knowledge this complication has not previously been reported.

**Methods:** There are three consultant surgeons performing IGB placement in our unit. We use the 'Obera' balloon system produced by Apollo. All balloons are placed under throat spray and/or conscious sedation in the endoscopy unit and are performed as day case procedures. We fill the balloon with 500–700 ml of normal saline stained with methylene blue. Balloons are removed after six months, after which patients are considered for definitive weight loss surgery.

**Results:** In two cases patients presented with abdominal pain and vomiting with X-ray and Computerised Tomogram imaging showing massive IGB dilation and an air fluid level. In both cases the total volume of the balloon was more than double that of the initially inflation. Cases presented at 45 and 74 days after placement. Placement was by two different surgeons, in different endoscopy rooms and from different batches. The patients underwent emergency removal of IGB and recovered well. Subsequent culture of fluid from IGB grew Lactobacillus and Streptococcus species.

**Conclusion:** IGB placement is a well-known aide in weight loss surgery, but it is not without complications. Here we see two different gram positive oral commensals, causing secondary infection in IGB, leading to failure of the IGB.

## PoD2

### The impact of Tier 3 Bariatric Services on short-term clinical outcomes following Laparoscopic Roux-en-Y Gastric Bypass

Ian Maheswaran, Rebecca Garvey, Bethany Greenwood, Christopher Pring, Guy Slater, William Hawkins

St. Richard's Hospital, Western Sussex Hospitals NHS Foundation Trust, Chichester, UK

**Background:** As presented at BOMSS 2015 in Newcastle, one CCG in our bariatric catchment area do not commission a Tier 3 bariatric clinic but continue to refer patients for surgery. In 2013, to comply with funding we created a streamlined, protocol-driven, nurse-run 'Pre-Surgical' Tier 3 (PST3) clinic and many of these patients have now had surgery. We initially aimed to see whether there was a difference in clinical outcomes between 3 groups of patients – historic patients from 2013 who had never been through Tier 3 and 2 groups who had surgery in 2014/5 who attended either standard Tier 3 or our PST3.

**Methods:** 3 groups (as above) of consecutive NHS patients who have undergone a laparoscopic Roux-en-Y gastric bypass by the same consultant surgeon were identified. All patients had at least 6 months of post-operative follow up. Patients with major complications were excluded. Percentage excess body weight loss and change in medical co-morbidities (as recorded in the National Bariatric Surgery Registry) were used as markers of clinical outcome.

#### Results:

	No Tier 3	Standard Tier 3	PST3
Average age	45.1 (28–64)	45.4 (21–68)	45.1 (20–62)
Pre-op BMI	48 (36.6–60.2)	48.4 (37–63.4)	45 (39.1–54.3)
M:F Ratio	2:13	5:10	4:11
6 month % EWL	64 (37.5–88.8)	62.3 (36–103.7)	67 (33.4–104.4)
Diabetes improved	3/3 = 100%	3/5 = 60%	3/5 = 60%
BP improved	5/8 = 62.5%	4/6 = 66%	6/7 = 85%
OSA improved	2/4 = 50%	1/3 = 33%	0/2 = 0%
Mobility improved	4/6 = 67%	6/7 = 85%	9/10 = 90%

**Conclusion:** These short-term results suggest that Tier 3 intervention has no significant impact on post-operative clinical outcomes. We will continue to monitor these three groups as they progress and also investigate whether their T3 experience impacted on their psychological or dietary preparedness for surgery.

## PoD3

### Zinc status in patients undergoing gastric bypass - are the BOMSS guidelines justified?

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<sup>1</sup>North London Obesity Surgery Service, London, UK, <sup>2</sup>St George's Hospital, London, UK

**Background:** Although trace metal deficiencies following gastric bypass are well described, there is considerable variation in the follow-up regimes of serum levels of trace metals in the UK. Recent guidelines by BOMMS have recommended annual post-operative (but not pre-operative) testing of zinc levels in patients undergoing gastric bypass but the evidence base for this recommendation is sparse. In our institution we have routinely undertaken pre- and post-operative monitoring of zinc levels and we evaluated the efficacy of this approach.

**Methods:** Our institution maintains a prospective database of all patients undergoing weight loss surgery. We interrogated this database to identify demographic data, co-morbidities and weight characteristics of all patients undergoing gastric bypass between February 2010 and March 2013. Using electronic records we identified all patients who had pre-operative measurement of serum zinc levels as well as those who had post-operative monitoring.

**Results:** In the time period, 304 patients underwent gastric bypass. The results of zinc monitoring are summarised below:

Trace Metal (Normal)	Pre-Operative			Post-Operative			
	Tested	High	Low	Tested	Mean Days Post-Op (SEM)	High	Low
Zinc (11-18 µmol)	221	16 (7%)	60 (27%)	276	226.9 (12.7)	3 (1%)	159 (57%)

As shown there was a significant incidence of pre-operative zinc deficiency and the majority of patients suffered with post-operative biochemical zinc deficiency despite multivitamin supplementation.

**Conclusion:** Pre-operative zinc deficiency is common in the obese population and is significantly exacerbated by gastric bypass. Our data supports the BOMMS guidelines for routine post-operative monitoring of zinc levels in patients undergoing gastric bypass and suggests these guidelines should be extended to include the pre-operative population.

## PoD4

### The support needs of people following bariatric surgery in the UK

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**Background:** Previous studies have shown how support following bariatric surgery (BS) may influence outcomes such as weight loss. UK bariatric policies and guidance recognise the need and requirement of bariatric clinical services (BCSs) to provide multidisciplinary team support and patient support groups following BS. It is currently unknown if people who have had BS and live in the UK feel their support needs are being met following BS or what types of support people need. This study aimed to investigate the support needs of people living in the UK and who have had BS.

**Methods:** The study had a cross-sectional, non-experimental survey design. The target population was adults who lived in the UK and who had a BS procedure. The survey was distributed via bariatric patient and professional networks throughout the UK and self-completed online. Descriptive and inferential statistics were used to analyse the data.

**Results:** 283 participants completed the survey. Time since surgery varied with just over half (54%) being >2 years. The majority were NHS funded (80%) and had undergone gastric bypass (57%) or sleeve gastrectomy surgery (24%). 70% of participants felt that overall, their support needs had not been fully met following BS and given the opportunity, most (68%) would choose to continue with formal support from their BCS after 2 years. Those who were >2 years following BS were less likely to have their support needs met compared to those <2 years ( $p = <0.001$ ). They were also increasingly likely to use informal types of support such as online forums. Having a gastric band was also associated with being less satisfied with support received compared to those who had a gastric bypass ( $p = 0.03$ ). Eating behaviours such as cravings, binge eating and avoiding eating was reported to require the most support (26%), followed by diet and nutrition (17%) and excess skin (17%).

**Conclusion:** Results of this survey suggest that the majority of people in the UK who have had BS do not feel that their formal and informal support needs have been met. Given our understanding of how support can positively impact on longer term health, particularly for those 2 years post procedure or with a gastric band, outcomes and patient experience could be improved. A review of the support that is currently provided in the UK to patients that had BS is warranted.

## PoD5

### A secondary care delivered programme for Severe Complex Obesity. An alternative to community based Tier 3 services?

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**Background:** ICOS (integrated complex obesity service) is a specialised secondary care service commissioned in 2015 following the closure of a local Tier 3 service. ICOS provides comprehensive assessment for those with severe complex obesity. Patients are referred for optimisation prior to bariatric surgery, or for a treatment plan meeting individual needs. Programme aims are weight stability or loss, increased physical activity, improvement in health parameters, an understanding of bariatric surgery and the changes required.

**Methods:** Patients are reviewed by a physician, psychologist and dietitian at initial MDT. Individualised dietary and behavioural targets are set with further clinical investigations or referral to the Diabetes specialist nurse as required. Further sessions focus on increasing physical activity, dietary change for weight loss and surgery, self esteem, emotional eating. A session on life post surgery is facilitated by an expert patient. On completion patients are assessed by the MDT and referred to Tier 4 only occurs if goals are met.

**Results:** 123 patients referred with 30 completed to date. 60% have Type 2 diabetes, 55% OSA, 30% each NAFLD, and hypertension. Additional new pathology detected includes 9 cases of OSA, 5 NAFLD, 2 T2DM amongst other obesity related diagnoses. Of the completers, mean starting BMI was 50.5 (39–82), completing 49.3 (38–76), indicating most were weight stable. Additionally there was a mean 80 m improvement in 6 minute walk test, (Mean start: 313 m with a range:0–570 m, mean end 394 m with a range: 0–550). 9 completers had T2DM, all but one showed improvement in HbA1C with weight stability. Mean starting HbA1C 78 mmol/mol (50–120), completing HbA1C 69 (40–112)

**Conclusion:** Despite being a high BMI, highly co morbid population, health benefits can be delivered by an integrated multi professional approach delivered in secondary care. Work is on-going to evaluate outcomes of patients as they progress to bariatric surgery.

## PoD6

### A pilot on the use of Patient Activation Measurement (PAM) in Bariatric Patients

Victoria Wilinski, Cleverly Fong, Pratik Sufi

Whittington Health, London, UK

**Background:** Patient Activation Measurement (PAM) is a validated and licensed questionnaire. It is designed to capture patients' knowledge, skills and confidence for self-management in health. PAM has been extensively tested with activation correlating to health outcomes and costs (Kings Fund, 2014). For example, low activated patients are more likely to be re-admitted to hospital within 30 days of discharge (Mitchell et al, 2014). Our aim was to measure if activation increased through the patient pathway.

**Methods:** 15 patients (3 pre-op and 12 post-op) were asked to complete the 13 item questionnaire at their dietetic appointment. Each item has four response categories ranging from strongly disagree, disagree, agree and agree strongly. Their total scores equated to their activation level ranging from 1 (least activated) to 4 (highly activated). Level 1 (0–47.0) the individual may not believe the patient role is important, level 2 (47.1–55.1) lacks confidence and knowledge to take action, level 3 (55.2–67.0) has begun to engage in the recommended health behaviour and level 4 (67.1–100) is proactive concerning health and engages in many types of recommended health behaviours.

**Results:** On commencing the bariatric journey patients' average activation level was low at a level of 2. Activation increased the further along the patient pathway with level 3 by 3 months and level 4 by 6 months post-op. 4 patients sampled were 23 to 42 months post-op and as such had been re-referred to

the bariatric dietitian with poor weight loss and poor health behaviour. Their average activation level was low at a level of 2.

**Conclusion:** This small scale pilot revealed a promising increase in activation levels with further distance along the patient pathway. For re-referred patients PAM provided an understanding of why they had poor outcomes. It is recommended the bariatric dietitians carry out a wider pilot for 1 year and record PAM scores for each pre and post bariatric dietetic appointment. Those with low activation (level 1 and 2) will be offered a referral into a 6 week patient self-management group and offered enhanced dietetic follow up. Future study will compare patient activation scores at key pathway points. In addition the study will examine if the enhanced follow up produces an increase in activation levels and/or an increase in percentage excess weight loss.

## P07

### Acute Gastric Herniation after Laparoscopic Sleeve Gastrectomy (LSG)

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**Background:** Hiatal herniae (HH) are commonly found in the obese patient. Controversy surrounds the performance of a LSG in the presence of a HH. Similarly there is controversy surrounding the operative strategy to deal with HH.

**Methods:** We present the case of a 54 year old female (BMI 42) who underwent LSG with reduction and repair of a moderate sliding hiatal hernia using 2 posterior and 1 anterior crural sutures. Postoperatively she had nausea, dysphagia and retrosternal discomfort to fluids. She was treated with IV steroids to help with sleeve oedema and nausea. On the 2nd postop day she had severe retrosternal pain radiating to her right shoulder. A contrast swallow was performed: this demonstrated no evidence of a leak, but there was an acute 'S' shaped bend affecting the distal oesophagus and proximal sleeve with acute oesophageal dilatation, Contrast flowed through the sleeve and into the duodenum. A CT scan confirmed acute para-oesophageal herniation of the proximal sleeve.

**Results:** Repeat laparoscopy confirmed the diagnosis, but the hiatal repair was intact. Reduction of the sleeve required the sutures to be removed. The sleeve was fixed by suturing it to the left crus and by a continuous suture along the whole staple line to omentum (inside the epiploic arcade). The hiatus was closed again with sutures. Her symptoms resolved immediately after surgery, and she tolerated stage 1 diet and was discharged after 24 hrs.

**Conclusion:** Delayed hiatal herniation has been reported to occur in 37% of patients 1–10 months after LSG. Acute herniation is a much rarer complication. Reported strategies for managing this complication include conversion to Roux-en-Y gastric bypass, fixation of the sleeve to the crus and falciform and reattachment to the omentum inside the epiploic arcade. We suggest that sleeve fixation should be performed for all patients who have a co-existing hiatal hernia to prevent acute gastric herniation.

## P08

### What factors influence the initiation of and motivation for a bariatric surgical referral?

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The University Hospital of the North Midlands, Stoke on Trent, UK

**Background:** Bariatric surgery is an effective modality for managing obesity and obesity-related comorbidities. Patients often have concerns about the perceived risks of surgery. Relatively little work has been done on determining patients motivations for requesting bariatric surgery. The objective of this study was to investigate the factors which initiate a referral and patient motivations for requesting bariatric surgery.

**Methods:** We asked consecutive patients presenting for the first time to bariatric clinic in September and October 2015 to complete a short questionnaire. The questionnaire explored the factors which initiated their referral to the bariatric services and the motivations behind their desire to lose weight.



**Results:** A total of 26 patients completed the questionnaire. 57.7% were women and the median age was 46. The mean BMI was 50.1 (range: 34–91.9). In the majority of cases (62.5%) it was the patient's GP who initially suggested bariatric surgery. 83.3% reported a desire to improve their quality of life as an important motivating factor and 96.2% wanted to lose weight so as to improve other medical conditions. 52% wanted to improve their diabetes. 36% required walking aids and 60% felt that their weight limited their mobility. 88.5% suffered from joint and back pains and 88.5% felt short of breath during routine activities. Significant numbers felt their weight restricted their ability to do routine activities such as housework (61.5%), showering and bathing (50.0%), dressing (34.6%) and playing with their children or grandchildren (45.5%). 92% reported that they thought weight loss would improve their self-esteem, 73.1% thought it would improve their leisure activities, 42.3% thought it would improve their employment opportunities, 26.9% thought it would improve their financial situation and 23.1% thought it would improve their personal relationships.

**Conclusion:** This study demonstrates that appreciation of the benefits of bariatric surgery by primary care physicians plays a significant role in motivating patients to consider weight loss surgery. Their support is vital in supporting patients through the process and maintaining weight loss in the long term. Patients are motivated by multiple factors but are overwhelming driven by a desire to improve their health and quality of life.

## P09

### Can clinical determinants predict liver status in surgical bariatric patients when compared to intraoperative liver biopsies?

Jennifer Harte, Brijesh Madhok, Chetan Parmar, Shlok Balupuri

Sunderland Royal Hospital, Sunderland, UK

**Background:** Non-alcoholic fatty liver disease (NAFLD) and non-alcoholic steatohepatitis (NASH) are common amongst morbidly obese patients. Currently liver biopsy is the gold standard in the diagnosis of NAFLD and progressive liver disease, however this is invasive and is not presently considered routine practice during bariatric surgery. The objective of this study is to assess if clinical predictors correlate with histopathological (HP) diagnosis of NAFLD and advancing liver disease, thus preventing intra-operative liver biopsy.

**Methods:** We performed a retrospective analysis of 16 patients who underwent trucut liver biopsies during laparoscopic bariatric surgery between 2012–2015, as a result of intraoperative appearances of NAFLD. The HP results were then compared to a number of variables including the presence of diabetes (T2DM), sleep apnoea and their QRISK2 to assess if these were predictive factors for NAFLD, NASH, fibrosis or cirrhosis. The QRISK2 algorithm calculates the risk of developing a heart attack/stroke within 10 years taking into account diabetes, hypertension and cholesterol/HDL ratio.

**Results:** HP results showed that six patients (37.5%) had NAFLD, three had NASH (18.7%), four had fibrosis (25%) and three had cirrhosis (18.7%). Of the 6 patients with NAFLD four had T2DM, three had OSA and a QRISK2 ranging from 12 to 51%. Of the 3 patients with NASH two had T2DM and OSA and a QRISK2 ranging from 4 to 47%. Two out of the four patients with fibrosis had T2DM, one had OSA and a QRISK2 ranging from 14 to 32%. In the three patients with confirmed cirrhosis, two had T2DM, one had OSA and the QRISK2 ranged from 11 to 40%.

**Conclusion:** The results of this study have shown that a higher QRISK2 score and presence of T2DM and OSA are not sensitive predictors of histological liver changes in bariatric patients. Hence liver biopsy is necessary to accurately diagnose NAFLD and advancing liver disease and should be considered in patients based on gross intraoperative appearances of the liver.

## P10

### An audit of gastro-jejunal anastomotic stricture rates using 21 mm circular stapler during laparoscopic Roux-en-Y gastric bypass

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**Background:** The incidence of morbid obesity continues to rise and laparoscopic Roux-en-Y gastric bypass (LRYGB) is currently the bariatric surgical procedure of choice. Patients undergoing LRYGB show sustained weight loss, resolution of co-morbidities and improved survival, however reports of high rates (up to 27%) of gastrojejunal (GJ) anastomotic stricture with 21 mm circular staplers has led to alternative staplers and techniques being used by some. We audited our practice of routine use of 21 mm stapler to assess anastomotic complications in terms of stricture rate and response to endoscopic dilatation.

**Methods:** The prospectively collected bariatric database was interrogated and all patients who underwent LRYGB, using the 21 mm circular stapler, from 01/04/2010 - 30/04/2015 were included. We maintained a low threshold for postoperative investigation of symptoms of nausea, vomiting or regurgitation (as possible indicators of stricture formation) by contrast study and/or upper GI endoscopy. All individuals undergoing postoperative endoscopy irrespective of the indication were evaluated and endoscopic findings and additional procedures recorded. We defined a stricture at the GJ site as the inability to pass the 9 mm endoscope beyond the GJ anastomotic site. All patients who were found to have a GJ stricture underwent endoscopic dilatation.

**Results:** In total 167 patients met the inclusion criteria, (median age 45 yrs [21–67], BMI 50.3 [35.8–64] and follow-up 45mths [21–67]). Forty-four patients (26.3%) underwent endoscopy. Eight patients (4.8%) were found to have strictures and all underwent at least one endoscopic dilatation. All but one of these strictures presented within 5 months of surgery.

**Conclusion:** Audit of our practice has shown that we have a low threshold for performing post-operative endoscopy, with over a quarter of patients undergoing the procedure. Only a small proportion, 4.8% were found to have a stricture. These findings justify the continued use of this technique in our unit.

## P11

### Novel approach of endoscopic removal of intrajejunal migrated gastric band

Chetan Parmar, Brijesh Madhok, Numan Hamza, Will Carr, Neil Jennings, Kamal Mahawar, Peter Small, Shlok Balupuri

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**Background:** Laparoscopic adjustable gastric banding (LGB) is one of the most commonly used surgical methods of weight loss. It is a popular initial management due to its reversibility and less invasive nature. Post operative complications include slippage, intractable reflux, failure of weight loss and intragastric erosion. Erosion is a significant complication of LGB. Diagnosis can be difficult as it can be asymptomatic. Erosion with migration into jejunum is rare. To our knowledge endoscopic technique of removal of such a band is not reported.

**Methods:** Our aim is to increase the awareness among all emergency specialty teams to this rare presentation following band migration and technique of endoscopic removal.

**Results:** A 43 year old woman who had LGB in 2008 was transferred from a district general hospital to our tertiary bariatric centre with abdominal pain and vomiting. Her last recorded band volume was 6ml. She had failed to attend repeated outpatient follow up appointments. A CT of the abdomen demonstrated band erosion and migration into the proximal jejunum. It was prevented from passing further by the tubing from the port secured in the abdominal wall. She was listed for endoscopy under general anaesthetic with the resources for laparotomy if required. A therapeutic colonoscope was used. This enabled a snare to be passed to cut the band tubing. The band was grasped endoscopically and removed per-orally. Check endoscopy was normal. The port was removed as routine. Post-operative stay was uneventful and the patient was discharged two days later on oral diet with routine follow up in bariatric clinic.

**Conclusion:** While gastric band migration is not uncommon (incidence ranges from 1–3.4%), this case highlights the rare complication of intrajejunal migration. The case emphasizes the need for enablement of quick and efficient referral and transfer to a tertiary bariatric centre. The team may be more comfortable with attempting endoscopic removal of a band in the first instance avoiding major laparotomy and morbidity.

**P12****Portal vein thrombosis following laparoscopic gastric plication for weight loss**

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**Background:** Portal vein thrombosis (PVT) following laparoscopic surgery including Roux-en-Y bypass, sleeve gastrectomy and Nissen's fundoplication is a rare but recognised complication. PVT following gastric plication has never been reported. We report a case of a patient suffering PVT as a complication of this surgery.

**Methods:** A 30 year old female from the UK, underwent laparoscopic gastric plication for obesity in Prague. She presented to the Emergency Department (ED) in London 10 days post-surgery with worsening abdominal pain. Whilst in hospital in Prague, she had vomited one day post-surgery; a contrast study conducted there was normal according to the patient. On presentation to the ED, she complained of central abdominal pain that radiated to her chest and back. She felt nauseous but was not vomiting. She had not opened her bowels or passed flatus for 2 days and had upper abdominal tenderness. Past medical history was unremarkable. She was tachycardic on admission and blood tests showed a CRP of 72. A CT of her abdomen and pelvis was performed and this demonstrated a splenic infarct of the superior pole secondary to splenic vein thrombosis, and a thrombus within the portal confluence and thrombosis of the right portal vein.

**Results:** She was commenced on therapeutic low molecular weight heparin (LMWH). Her thrombophilia screen was negative. She remained as an inpatient for one week whilst her symptoms resolved and her CRP decreased to less than 5. She continued LMWH for 4 weeks before starting warfarin.

**Conclusion:** Although it is rare, PVT following laparoscopic bariatric surgery should be considered as a cause for abdominal pain in the post-operative phase.

**P13****Long term outcomes following stenting for post-operative leak after gastric bypass**Lewis Stevens<sup>1</sup>, Jasmine Mann<sup>1</sup>, Ali Alhamdani<sup>1</sup>, Pratik Sufi<sup>1</sup>, Mohammad Howlader<sup>1</sup>, Omar Khan<sup>2</sup><sup>1</sup>North London Obesity Surgery Service, London, UK, <sup>2</sup>St George's Hospital, London, UK

**Background:** Management of post-bariatric procedure leak is challenging. In recent years endoscopic stent placement has gained popularity as a technique of control of leak whilst healing takes place. However, the long term outcomes associated with stenting in gastric bypass are poorly described. Our study aim is to delineate the medium and long term outcomes after stenting for leak after gastric bypass.

**Methods:** A prospectively maintained database of all patients undergoing gastric bypass at our institution was interrogated to identify those patients suffering a post-operative leak and subsequent endoscopic stenting between April 2009 and November 2010. Pre-operative demographics, co-morbidities and weight parameters were analysed as were details of stent placement and removal, stent related complications and weight parameters at one year and at most recent follow-up.

**Results:** Between April 2009 and November 2010, ten patients underwent endoscopic placement of a stent to manage leak after gastric bypass had been performed. Stents were placed for confirmed leaks 0–20 days post-operatively (median 1.5 days). Stents remained in situ for an average of 57 days, with removal being successfully performed endoscopically in eight cases. Four patients had problems with pain relating to their stent, one patient suffered stent migration, one patient developed ulceration at the stent site and one patient had an oesophageal mucosal degloving injury on stent removal requiring prolonged hospital stay. Post operatively one patient died secondary to complications of leak 218 days and at one year follow-up the mean excess body weight loss (EBWL) of 66.6% with longer term follow-up (mean follow-up of 3.6 years: range 1.8–5.0 years) the mean EBWL was 58.2%.

**Conclusion:** Endoscopic stent placement for leak after gastric bypass is associated with significant complication rates but longer term outcomes after stenting are good.

**P14****Edmonton Obesity Staging System (EOSS) and Systematic Coronary Risk Evaluation (SCORE) among patients qualified for bariatric surgery**Aleksandra Mojowska<sup>1</sup>, Maciej Pietruszka<sup>1</sup>, Grzegorz Redlisz-Redlicki<sup>1</sup>, Marek Kozlowski<sup>2</sup>, Mariusz Fraczek<sup>2</sup>, Mariusz Wylezol<sup>1</sup><sup>1</sup>Department of Surgery, Military Institute of Aviation Medicine, Warsaw, Poland, <sup>2</sup>Department of General and Oncological Surgery, Praski Hospital, Warsaw, Poland

**Background:** Edmonton Obesity Staging System (EOSS) is a 5-point ordinal classification system which considers co-morbidity and functional status in predicting mortality due to obesity. Patients with stage 2 and 3 EOSS should be qualified for bariatric surgery. Global cardiovascular risk can be stratified with Systematic COronary Risk Evaluation (SCORE) which estimates 10-year risk of death from cardiovascular diseases. SCORE is based on gender, age, total cholesterol, systolic blood pressure, smoking status and it do not include obesity. There are four SCORE classes: low, moderate, high, very high. The goal of the study is to assess SCORE among patients qualified for bariatric surgery in accordance to current guidelines based on BMI, and compare it with EOSS.

**Methods:** Retrospective analysis of prospectively collected data of 30 consecutive morbidly obese patients who underwent bariatric surgery. We estimated SCORE Poland Risk Charts. EOSS was applied to each patient.

**Results:** Among 30 patients, there were 24 (80%) women, average age was 44.7 years. Average BMI was 47.7. Applying the EOSS we found six patients (20%) with stage 3, 23 (76%) patients with stage 2. The only one patient (3.3%) was with stage 1 (BMI=40.9). Applying the SCORE we found in six patients (20%) low risk of death from cardiovascular reasons, their average age was 33.7 years, all were female, all were with stage 2 EOSS. In sixteen (12 women) patients (53.3%) SCORE was moderate, the average age in this group was 41.3 years, one patient was with EOSS stage 1, twelve patients were with EOSS stage 2 and three patients were with EOSS stage 3. In four patients (13.3%) the SCORE was high, average age was 56.5 years, in this group was one man, three individuals were with EOSS stage 2, and one was with EOSS stage 3. In four (3 women) patients (13.3%) the SCORE was very high, average age was 62.8 years, among them two patients were with EOSS stage 2 and the rest two patients were with EOSS stage 3.

**Conclusions:** Using SCORE in bariatric patients might be inadequate. Risk of cardiovascular death might be underestimated in obese patients, especially in young (under forty years old) and female. EOSS could be better tool to assess long term mortality, and thus allows for more adequate qualification for bariatric surgery.

**P15****Anti-peristaltic Intussusception: A rare complication after Laparoscopic Roux-En-Y Gastric Bypass (LRYGB)**

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**Background:** Internal hernia is a common complication following LRYGB surgery. Literature quotes 1-9% of LRYGB patients develop internal herniation through Petersen's or mesenteric defect. Delay in recognising this problem has the risk of strangulation of bowel and increase in morbidity and mortality of the patients. To our knowledge intussusception combined with internal herniation is not reported in literature.

**Objective** Our aim is to increase the awareness among all emergency specialty teams to this rare presentation following LRYGB.

**Results:** A 38 year old female, 28 months post LRYGB weighing 80kgs (Initially 191kgs), presented to a neighbouring surgical unit with abdominal pain and vomiting. Her MEWS was 0. Initial bloods were within the normal range, AXR showed dilated small bowel, CT suggested intussusception at the jejuno-jejunal(JJ) anastomosis. At laparotomy the common limb had intussuscepted into the alimentary limb obstructing the JJ anastomosis. The common limb had also herniated through the meso-mesenteric defect. Approximately 80 cm of non-viable small bowel required resection. The patient made satisfactory postoperative recovery and was discharged 6 days post operatively. Her histology has confirmed intestinal ischaemia secondary to intussusception.

**Conclusion:** Internal herniations via the mesenteric or Petersen's defect are known complications following RYGB. Antiperistaltic intussusception of the common limb into the alimentary limb combined with an internal herniation via the mesenteric defect is an unheard of complication. Doctors need to be aware of this serious pathology having a low threshold for seeking bariatric surgical intervention. This can prevent life threatening bowel ischaemia.

## P16

### Outcomes following bariatric surgery by deprivation status: Diabetic response and weight loss

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**Background:** It is well known that lower socio-economic status and more deprived populations have an increased prevalence of obesity [1]. It is currently unclear as to whether deprivation is associated with specific surgical outcomes. We aimed to identify the diabetic and weight loss results following bariatric surgery in our Scottish centre.

**Methods:** A prospective database of all bariatric patients within our department was interrogated using postcodes to identify Scottish Index of Multiple Deprivation (2012). Our practice accepts referrals Scotland wide offering intra-gastric balloon, gastric banding, bypass, sleeve gastrectomy and revisional surgery.

**Results:** From 2004 to present we have 254 patients who have underwent or attended for a bariatric procedure within our unit. Median age was 44 years. The commonest procedure was primary gastric bypass (n = 85, 33.5%). The referral origin for all patients was spread across 9 health boards with the majority of patients residing within Grampian. Postcodes were used to categorise datazones ranging from Decile 1 (most deprived) to Decile 10 (least deprived). The median weight loss was 46.5 kg. At time of last follow up the majority of patients had achieved reduction in diabetic treatment (Table 1). Those who were IDDM remained on insulin with reduction in dosage. Weight loss did not seem to differ significantly with deprivation.

**Conclusion:** We show our weight loss results and diabetic response rates by deprivation status. Further numbers will help identify any trend associated with type of procedure.

Decile	1 (most deprived)	2	3	4	5	6	7	8	9	10 (least deprived)
DM n	1	2	2	3	4	10	9	9	5	11
Diet controlled n	0	0	0	0	0	0	1	1	1	1
n (%)	1 (100)	2 (100)	1 (50)	2 (67)	4 (100)	8 (80)	4 (45)	6 (67)	3 (60)	9 (82)
Reduced treatment										
Mean weight loss 1 year (kg)	NA	36.7	39.8	41.9	56.2	32.5	45.1	25.7	39.3	43.0

## P17

### Predicting maximal oxygen uptake (VO<sub>2</sub> max) in the morbidly obese

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*St George's Hospital, London, UK*

**Background:** Maximal oxygen uptake (VO<sub>2</sub> max) is used a measure of cardiovascular fitness for surgery. It is often estimated with the Wasserman/Hansen equation based on body mass; however, this method has not been validated in the morbidly obese population. Therefore we compared values for VO<sub>2</sub> max estimated using this equation to actual physiological VO<sub>2</sub> max measured using cardiopulmonary exercise testing (CPET).

**Method:** Pre-operative data was collected on sixteen patients due to undergo bariatric surgery for morbid obesity. This included anthropomorphic and bicycle/ treadmill CPET measurements. The Wasserman/Hansen equation was used to calculate predicted VO<sub>2</sub> max for our patients, and then modified to generate estimates based on their fat free mass and ideal body weight. Measured data was compared with the calculated predicted data and the coefficient of determination (R<sup>2</sup>) was calculated to estimate fit.

**Results:** Of 16 patients, 15 were female and 1 male. Mean age was 41 years (range 27 to 47) and mean BMI was 50 kg/m<sup>2</sup> (range 45 to 54).

Measure of weight used to calculate predicted VO <sub>2</sub>	Coefficient of determination (R <sup>2</sup> ) between predicted and measured VO <sub>2</sub> max
Actual weight	0.448
Fat free mass	0.466
Ideal body weight	0.166

**Conclusion:** In the morbidly obese, VO<sub>2</sub> max estimates using a Wasserman/Hansen equation based on actual mass, fat free mass or ideal body weight are not accurate. In this population, VO<sub>2</sub> max must be formally assessed by CPET.

## P18

### Bariatric Surgery as a treatment for Idiopathic Intracranial Hypertension: A systematic review

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**Background:** Idiopathic intracranial hypertension (IIH) is a chronic neurological disease that may result in persistent and debilitating symptoms.

**Objectives:** The aim of this study was to systematically review the effect of bariatric weight reduction surgery as a treatment for IIH.

**Methods:** A comprehensive literature search was conducted using the following databases: MEDLINE, EMBASE, PubMed, Scopus, Web of Sciences and the Cochrane Library.

**Results:** A total of 85 publications were identified and after initial appraisal 17 were included in the final review. Overall improvement in symptoms of IIH following bariatric surgery was observed in 60 of the 65 patients observed (92%). Postoperative lumbar puncture opening pressure was shown to decrease by an average of 18.9 cmH<sub>2</sub>O in the 12 patients who had this recorded.

**Conclusion:** Bariatric surgery for weight loss is associated with alleviation of IIH symptoms and a reduction in intracranial pressure. Furthermore, an improvement was observed in patients where conventional treatments including neurosurgery were ineffective. Further prospective randomised studies with control groups and a larger number of participants are lacking within the published studies to date.

**P19****Unusual complication following a recent Laparoscopic Roux-en-Y Gastric Bypass Obesity Surgery**Ahmad Al Samaraee, William Carr, Chetan Parmar, Numan Hamza, Peter Small, Shlokarth Balupuri*Sunderland Royal Hospital, Sunderland, UK***Background:** We present a case of splenic abscess complicating a recent Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) obesity surgery.**Methods:** Case report - A forty three years old patient presented to her routine follow-up appointment six weeks post LRYGB, with a history of worsening left upper abdominal pain over the previous 3 weeks with sepsis. She denied any history of abdominal or chest trauma. Radiological investigations revealed a 6 cm splenic abscess complicating a subcapsular haematoma, with features of splenic vein thrombosis. The patient was managed with bed rest, antibiotics, low molecular weight heparin (LMWH), and radiological drainage after a week of conservative treatment had failed to improve her condition.**Conclusion:** Splenic abscesses are rare, with mortality rates of 12%–47%. The reported causes include infection spread from other sites, splenic infarction and splenic trauma. Porto-mesenteric veins thrombosis association with bariatric surgery is well reported in literature; particularly with laparoscopic sleeve gastrectomy. The pathophysiology behind it is not well understood, but suggested possible contributing factors include reverse Trendelenberg positioning, increased intra-peritoneal pressure with CO<sub>2</sub> insufflation that could result in decreased portal venous blood flow, perioperative dehydration, and the prothrombotic status associated with obesity. Other authors suggest that intra-abdominal sepsis due to leak from the staple lines could be a major contributing factor. However, in this case, no other source of intra-abdominal infection was identified. Consideration was given to splenic artery embolization to reduce bleeding risk or splenectomy to treat sepsis and prevent delayed bleeding; but as sepsis was the primary presenting complaint, percutaneous drainage of the infected haematoma was performed with a successful outcome. We believe this to be the first report of an infected subcapsular haematoma complicating RYGB and treated successfully with a percutaneous drain.**P20****Safety and efficacy of bariatric surgery in patients post renal transplant: a systematic review**Emma Rose McGlone, Nancy Hadjievangelou, Myutan Kulendran, Marcus Reddy, Omar Khan*St George's Hospital, London, UK***Background:** Obesity is common amongst patients with renal transplants (RT). It is associated not only with generic obesity-related complications including diabetes, but also with higher rates of graft rejection and loss. The aim of this study was to conduct a systematic review to determine the safety and efficacy of bariatric surgery (BS) in this potentially high-risk cohort.**Methods:** A standardised literature search was performed including the keywords 'bariatric', 'obesity', 'renal', 'kidney', 'transplant' and 'graft'. This yielded 501 titles which were appraised independently by two authors. Those that were irrelevant, non-human or reviews were excluded. Data was pooled where applicable.**Results:** Four prospective case series and one multicentre retrospective study were identified, together reporting on a total of 116 patients who underwent BS after RT. Length of time between RT and BS was recorded in 111 patients: the mean interval was 6.5 years. Eighty-seven patients underwent open BS, of which 57.5% were gastric bypass (RYGB); of laparoscopic operations 15 were sleeve gastrectomies and 14 RYGB. 63% patients were followed-up for 12 months or longer. For all patients 30-day mortality was 2.6%: all occurred after open BS. Percentage excess weight loss was highly variable between the studies, ranging from an average of 30.8% to 75% at 12 months. One graft rejection occurred within 30 days of surgery. Change in immunosuppressant medication post-BS was recorded in 15 patients: three required dose-reduction, 1 required dose-increase and 11 experienced no change. Three studies recorded change in

co-morbidities: all patients assessed experienced an improvement, with complete resolution of diabetes in three.

**Conclusion:** Bariatric surgery is safe and feasible for selected obese patients post renal-transplant. Available data demonstrates good short-term excess weight loss and resolution of co-morbidities. Further studies are required to determine long-term and quality of life outcomes, as well as optimum type and timing of bariatric operation post RT.**P21****Structured pre-operative preparation and follow-up improves weight loss following Bariatric Surgery**Jennifer Robertson<sup>1</sup>, Anne Clarke<sup>2</sup>, Andrew Crumley<sup>2</sup>, Christopher Shearer<sup>2</sup><sup>1</sup>Queen Elizabeth University Hospital, Glasgow, UK, <sup>2</sup>Forth Valley Royal Hospital, Glasgow, UK**Background:** Rising levels of obesity and associated co-morbidities is increasing demand for bariatric surgery. Patients fulfilling NHS criteria for bariatric surgery must interact with a multi-disciplinary team, losing 5-10 kg weight pre-operatively. Long term follow-up is mandatory. Many patients undergo surgery in the private sector where follow-up can be haphazard. This study compares weight loss between these two cohorts.**Methods:** A retrospective review of patients attending Weight Management clinic in NHS Forth Valley was conducted. Patients had either undergone surgery through the local NHS programme or had presented following surgery performed elsewhere in the private sector. Percentage excess weight loss was compared between the groups.**Results:** 133 patients were identified: 84 patients underwent NHS surgery while 49 had surgery in the private sector. Operations were performed between 2004 and 2014 with 6 months minimum follow-up. NHS patients had higher mean pre-operative weight (137.2 kg versus 124.3 kg; BMI 49 versus 45, p = 0.023). NHS patients lost higher percentage of excess weight than private sector patients (46.6% versus 30.1%, p = 0.001).**Conclusion:** Pre-operative interaction with a multidisciplinary team and structured post-operative follow-up is associated with greater excess weight loss following bariatric surgery. Further studies will help determine whether this association is independent of pre-operative weight.**P22****A pilot 12 week pre-operative physical activity programme: initial findings and future developments**

Anna Young, Alfred Markovits, Melanie Rendall

*Homerton University Hospital NHS Trust, London, UK***Background:** Physical activity is increasingly being shown to be a critical factor in weight maintenance post bariatric surgery. The majority of pre-operative patients have low levels of activity and are unlikely to make the necessary changes postoperatively. Pre-operative physical activity behavior has been shown to be the strongest predictor of postoperative physical activity behavior, suggesting that a focus on increasing physical activity pre-operatively is warranted. A 12 week interdisciplinary-led physical activity group for bariatric patients on the surgical pathway was therefore piloted.**Methods:** Sessions were conducted on a weekly basis, with a 30 minute discussion followed by a 45 minute physical activity class. Topics included goal-setting; overcoming barriers to physical activity; mindful eating and managing unhelpful thoughts. Outcomes included weight loss; physical activity levels and enjoyment; and patient satisfaction/feedback.**Results:** 12 patients started the programme, with 9 completers. On average, each patient lost 3.4 kg, had a 5.8 cm reduction in waist circumference and walked 35 m more in 6 minutes. Patient feedback and patient reported changes were positive.



**Conclusion:** The intervention has shown initial promise in encouraging positive behaviour change prior to surgery. Feedback has been incorporated into the next stage of the pilot, alongside an introduction of activity monitors to explore additional benefit on motivation and behaviour change. Future development would also look to monitor longer term outcomes, including post-operative weight loss and physical activity levels.

## P23

### STEPWISE: a 12 month weight management programme for potential bariatric surgery patients

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**Background:** NHS England eligibility criteria for bariatric surgery stipulate that patients must complete a 12 month Tier 3 weight management programme. Unfortunately, only 10% of patients referred into the bariatric service have access to these services. This is due to a lack of community provision. We have developed a Tier 3 service (STEPWISE) for potential bariatric patients to address this gap in service provision which would otherwise result in individuals not being able to access treatment as recommended by NICE (CG189, 2014). STEPWISE provides intensive dietetic and psychological intervention to help people make behavioural changes to manage their weight and prepare them for bariatric surgery.

**Methods:** The aims are to a) determine how many patients referred into the bariatric service do not meet NHS England criteria and therefore need to attend STEPWISE b) review the number of patients who complete the STEPWISE programme and proceed to bariatric surgery c) present preliminary clinical data on the outcomes of STEPWISE.

**Results:** In 2014, 79% of the 275 patients referred to the bariatric service were referred on to STEPWISE. Of these, 77% remain in the programme or have been referred for surgery. Rates of weight loss vary significantly between individuals but the majority of patients (67%) lose weight (average = 7.5 kgs, 5.2% twl). Those patients with binge eating patterns lose significantly less weight ( $t = 2.0$ ,  $df = 99$ ,  $p < .05$ ) in STEPWISE.

**Conclusion:** The programme leads to a number of patient benefits as well as addressing a service gap. Patient satisfaction ratings with STEPWISE are high. The drop-out rate for this programme is considerably lower than for equivalent services (15% versus 63% reported by Morrison et al, 2011). Individuals with binge eating patterns lose less weight during STEPWISE and we have developed a specific group programme for these patients. The impact of the weight management program on outcomes after bariatric surgery will be evaluated in future.

## P24

### Does pre-operative endoscopy reduce the need for revisional surgery in sleeve gastrectomy?

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**Background:** The incidence of sleeve gastrectomy is increasing rapidly around the world. The use of pre-operative endoscopy varies between centers. In our practice the commonest cause for revisional surgery following sleeve gastrectomy is intractable reflux disease. We hypothesized that the introduction of routine pre-operative endoscopy may reduce the incidence of revisional surgery.

**Methods:** We audited our sleeve gastrectomies from 2007–2014 for all cases with a minimum of 12 months follow up. We introduced compulsory endoscopy for all sleeve gastrectomy patients in 2010. Revisional surgery rates were compared between patients who had and had not undergone pre-operative

endoscopy prior to surgery. Following 2010 patients with a significant hiatus hernia or evidence of reflux disease at endoscopy were advised to undergo Roux-en-Y gastric bypass (RYGB) rather than sleeve gastrectomy.

**Results:** 398 patients were eligible for the study. 119 patients did not have a pre-operative endoscopy compared to 279 patients who underwent pre-operative endoscopy. The rate of revisional surgery was 9.2% (11/119) in patients with no endoscopy compared to 1.8% (5/279) in patients who were endoscoped prior to surgery. The difference observed between the two groups was statistically significant when analysed using the Chi squared calculation ( $p = 0.002$ ).

**Conclusions:** This study suggests that the use of pre-operative endoscopy may be associated with a reduction in revisional surgery rates for sleeve gastrectomy. The authors believe that pre-operative identification of a hiatus hernia or signs of reflux disease allowed patients to be counseled to undergo an alternative procedure (RYGB).

## P25

### The changing face of bariatric surgery. Are we delivering better results for our patients?

**James Latimer<sup>2</sup>, Maureen Boyle<sup>1</sup>, William Carr<sup>1</sup>, Kamal Mahawar<sup>1</sup>, Norbert Schroeder<sup>1</sup>, Shlok Balupuri<sup>1</sup>, Peter Small<sup>1</sup>, Neil Jennings<sup>1</sup>**

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**Background:** There is debate over what is the ideal bariatric procedure. Our unit has seen significant change in practice over the last 13 years with Roux-en-Y gastric bypass and loop gastric bypass surgery replacing gastric banding and sleeve gastrectomy respectively. Has our change in practice led to better patient outcomes?

**Methods:** Between 2001 and 2014 the number and type of procedure, average weight and BMI at presentation, excess weight loss at one and two years post surgery and reduction in BMI at one and two years post were analysed using the Pearson correlation in SPSS.

**Results:** Over the time course of the study there was a significant increase in the number of total operations ( $r = 0.9$ ,  $p = 0.001$ ), bypasses ( $r = 0.87$ ,  $p = 0.001$ ), loop bypasses ( $r = 0.64$ ,  $p = 0.014$ ) and sleeve gastrectomies ( $r = 0.59$ ,  $p = 0.024$ ). No significant change was seen for gastric banding. EWL at one and two years post surgery significantly increased over time (EWL1  $r = 0.9$ ,  $p = 0.001$ , EWL2  $r = 0.91$ ,  $p = 0.001$ ). Reduction in BMI at one and two years post surgery significantly increased over time ( $r = 0.79$ ,  $p = 0.01$ / $r = 0.8$ ,  $p = 0.01$ ).

**Conclusions:** Significant changes in the types of surgery offered to patients occurred over the time course of the study. Initially gastric banding was the most common procedure but this has largely been replaced by gastric bypass surgery. In the final seven years of the study sleeve gastrectomy and loop gastric bypass surgery were introduced. Despite significant changes in surgical practice we have been able to deliver consistently good results with improved average weight loss observed year on year.

## P26

### Medium-term results of Band on Bypass as a salvage procedure for weight regain after RYGB

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**Background:** RYGB remains the gold standard bariatric procedure, but late weight regain due to pouch or C/J anastomotic dilatation is not uncommon. Treatment options are limited and include re-stapling, limb lengthening and endoscopic approaches, none of which have proved reliably effective. In the USA placement of an adjustable gastric band around the gastric pouch (BoB Procedure) has yielded encouraging results, but with significant complications and a 10% re-operation rate. No UK experience with the BoB has been reported. We present our results using BoB in patients followed up for at least 18 months.

**Methods:** Data on all patients undergoing BoB for weight regain after RYGB between 2010 and 2015 were analysed from a prospectively collected database.

**Results:** Dietetic support and band adjustments were provided up to 45 months post-op (median 20.5 months). Of the patients with >18-month follow-up, 88% (14/16) either lost weight or their weight gain was arrested.

	Pre-BoB	Post-BoB	P value
Weight	108.4 kg (82.8 – 142.4)	99.5 kg (75.8 – 126)	0.04
BMI	39.6 (31.6 – 42.6)	36.9 (26.2 – 42.6)	0.045
% EWL	40.1% (5.3 – 67.2)	56.2 (7.9 – 95.6)	0.04

There were 2 major and 1 minor complications (n = 16): 1 acute obstruction caused by herniation of small bowel through a slack loop of band tubing, 1 band erosion (removed endoscopically) and one flipped port. Mortality at 2 years = 0%.

**Conclusions:** This is the only known UK series of BoB as a salvage procedure for weight regain after RYGB. Our findings suggest it is effective at arresting weight gain and results in significant weight loss in most patients reviewed up to 45 months post-op. It can be performed safely; however similar complications to primary adjustable gastric bands can arise. Larger, multi-centre longer term studies are required to fully appraise the safety and effectiveness of BoB.

## P27

### Comparison of weight loss outcomes amongst smokers versus non-smokers in patients undergoing Roux-en-Y gastric bypass

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**Background:** Smoking is known to significantly increase the risk of post-operative complications in patients undergoing gastrointestinal surgery. Our aim was to investigate if smokers suffered excessive weight loss compared to non-smokers following Roux-en-Y gastric bypass (RYGB).

**Methods:** Patients who underwent RYGB from 01/01/2012 to 31/12/2013 were identified from our prospectively maintained database. Weight loss outcomes after follow up of two years were compared amongst smokers and non-smokers. Statistical significance was examined using two-sample t test.

**Results:** Some 701 patients underwent RYGB during this two-year period. Of these, 102 were still smoking in the peri-operative period. Weight and body mass index (BMI) at presentation were similar between the two groups. At two years, mean total weight loss of 47 kilograms (kg) [standard deviation (SD) 14.4] amongst smokers was similar to that in non-smokers (mean 44.5 kg, SD 16.1, p = 0.66). The percentage of excess weight loss (EWL) was also comparable between the two groups [72 (21) vs. 73 (21), p = 0.69]. However, the number of patients losing more than 80% of their excess body weight was significantly higher in the smoking group (48% vs 28%, p = 0.003).

**Conclusion:** Patients who continue to smoke in the peri-operative period are at risk of excessive weight loss (>80% EWL), and hence at risk of malnutrition. Our efforts to understand the explanation for this observation is underway, possibly higher risk of complications such as marginal ulcer or symptomatic reflux may be accountable. Further research is warranted to investigate the risk of malnutrition in this sub-group. However, cessation of smoking should be strongly emphasised in the pre-operative work-up and counselling.

## P28

### The utility of preoperative endoscopy in the bariatric surgery patient

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**Background:** Pre-bariatric surgery endoscopy is useful in not only detection of upper gastrointestinal tract pathology but also as an adjunct to the selection of the appropriate bariatric procedure for each patient. Although not universally implemented across the specialty, the Oxford Bariatric Unit performs a preoperative upper GI endoscopy in all patients who are planned for a sleeve gastrectomy, have a history of reflux or previous peptic ulceration. Our aim was to determine the prevalence of significant pathology encountered.

**Methods:** A retrospective review of pre-bariatric surgery endoscopies performed between May 2013 and October 2015, when the practice of pre-operative Upper GI endoscopy became routine in our unit, was performed. Clinical data was obtained from patient's electronic record.

**Results:** A total of 105 endoscopies were performed with 55.2% (58/105) reported as normal and 44.8% (47/105) detecting abnormalities - the commonest pathology being the presence of a hiatus hernia > 3 cm (16/105), followed by oesophagitis (9/105), gastritis (9/105) and duodenitis (5/105). Significantly we identified early malignancies in 2 patients, one high grade dysplasia in Barrett's (subsequently found to be intramucosal adenocarcinoma after endoscopic mucosal resection) and one GIST (subsequently resected laparoscopically). During this period, 118 patients underwent bariatric procedures (68 RYGB and 50 Sleeve Gastrectomies), with 32 patients who underwent endoscopy currently awaiting surgery.

**Conclusion:** Preoperative endoscopy is useful in detecting minor pathology and thus influencing selection of the most appropriate bariatric procedure for patients. Major pathology requiring urgent treatment was encountered in a small, but not insignificant, number of patients.

## P29

### The role of oesophagogastroduodenoscopy in the first two years post laparoscopic gastric bypass

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**Background:** Upper gastrointestinal (GI) symptoms are common post bariatric surgery. The aim of this project was to appraise the need for and outcomes of oesophagogastroduodenoscopy (OGD) post laparoscopic gastric bypass (LGBY) for the management of morbid obesity.

**Methods:** A retrospective analysis of all cases of LGBY carried out at our institute over a two-year period. All preoperative and postoperative OGDs were performed by (or under direct supervision of) a consultant bariatric surgeon. The data are presented as median (range).

**Results:** Between October 2012 and October 2014, 772 consecutive patients (585 female), aged 47 (20–74) years with a preoperative body mass index of 43 (31–69) kg/m<sup>2</sup> underwent LGBY procedures. At a follow up of 25 (12–37) months, 95/772 (12.3%) patients underwent 133 OGDs post LGBY for upper GI symptoms (79 female). Ninety-Five patients underwent 1 OGD, 23 patients underwent 2 OGDs, and 15 patients had 3 or more OGDs. The indications for the first OGD were pain (n = 41), dysphagia (n = 15), vomiting (n = 8), dyspepsia (n = 7), others symptoms (n = 24). The median (range) interval between LGBY and the first OGD was 6.5 (1–24) months. In patients undergoing their first OGD, 54 (57%) patients had normal examination, marginal ulcer(s) was identified in 15/95 patients (16%), this represents 2% of the whole group of 772 patients, 4 (4%) had pouchitis, 4 (4%) with oesophagitis, and 18 (19%) patients had other abnormalities. Interestingly, 34/95 (36%) of these patients underwent CT examination(s) as well to investigate their symptoms.

**Conclusion:** Within the first two years of LGBY, 1 in eight patients required OGD for postoperative upper GI symptoms, of those about 1 in 6 would have marginal ulcer(s). These findings have implications in the preoperative counselling of the patients, and in the allocation of resources, including treatment and follow up, in the postoperative phase.

## P30

**How informed is the consent for Roux-en-Y gastric bypass?**

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**Background:** Informed consent is a vital part of any surgical procedure. It's importance in bariatric surgery is elevated further by the elective yet invasive and life changing nature of the procedures involved. We assessed patient knowledge of laparoscopic Roux-en-Y gastric bypass (RYGB) on the evening before their operation.

**Methods:** Questionnaires were completed on the bariatric ward by 50 consecutive patients admitted the day before RYGB, before being consented by the surgeon. Anonymised questionnaires were issued and collected by junior doctors who were not involved in pre-operative patient education or in data analysis. Data was analysed after 50 completed responses were received.

**Results:** Fifty completed questionnaires were received. 76% of patients said they had received just the right amount of information pre-operatively, while 16% wanted more. 66% of patients thought that part or all of their stomach would be removed during RYGB. When asked about surgery for excess skin, 40% were unaware of the difficulties of getting this on the NHS. 68% had incorrect information about the reversibility of RYGB. Regarding post-operative instructions, all patients identified that they would have to take vitamins and minerals for life and 88% were correct about the recommendations for a pureed diet.

**Conclusion:** Despite at least 6 months of pre-operative work-up and patient education, including a bariatric seminar, significant gaps in patient knowledge were identified. Post-operative instructions (delivered by dieticians) were better understood than operative detail (delivered by surgeons). Targeted patient education about their specific procedure is required to improve understanding and fully achieve informed consent.

## P31

**Patients with high BMI can safely and effectively undergo Elective biliary surgery**

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**Background:** Elevated BMI has traditionally been associated with increased surgical risk and thus has influenced decision making in surgical management of elective gallstone pathology. We investigate evidence for this approach.

**Methods:** A comprehensive retrospective audit of laparoscopic cholecystectomy outcome was conducted using patient notes and hospital databases.

**Results:** Between 2009 and 2015 a total of 1622 elective laparoscopic cholecystectomies were included in this study. 897 were performed in patients with BMI <30, 435 were performed in patients with BMI 30–34.9, 204 in patients with BMI 35–39.9 and 86 in patients with BMI >40. There was no significant difference in duration of operation between groups- 70.5, 73.1, 70.5 and 73 mins respectively (median),  $P > 0.05$ . There was no significant difference in day-case rates 74.8, 75.6, 72.1 and 76.4% respectively and duration of stay if not day-case between groups was not different,  $P > 0.05$ . There was no difference in 30 day readmission with complication 5.1, 3.9, 4.4 and 4.7 % respectively ( $P > 0.05$ )

**Conclusion:** With the advent of improved peri-operative care and surgical technique learnt from bariatric surgery this study provides strong evidence that obesity is not a factor that should influence risk-benefit decision making in the management of elective gallstone biliary disease in the obese.

## P32

**The use of OGD in routine preoperative investigation for bariatric surgery: Findings and implications for management**

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**Background:** The use of oesophagogastroduodenoscopy (OGD) as part of routine preoperative workup for bariatric surgery patients is a matter of debate amongst surgeons. Some view the procedure as a necessary component of management, reporting a high rate of abnormal findings, some of which alter surgical management<sup>1</sup>. Others argue for selective use, especially where gastric bypass is planned due to the low yield of results that would alter the surgical approach<sup>2</sup>. A wide range of frequency of abnormality at OGD is reported in this population, in part due to interpreter variability in the diagnosis of conditions such as hiatus hernia<sup>3</sup> and to variation in incidence in populations in different areas – previously reported figures for Barrett's oesophagus in bariatric patients range from 0/142 (Rome, Italy)<sup>4</sup> to 24/232 (Jacksonville, Florida)<sup>5</sup>. Moreover, there is variation in the interpretation of the relevance of these findings for bariatric surgery, with practice varying across centres. There is little explicit data on the effect that OGD findings had on surgical management, particularly from centres in the UK.

**Aims:** We aimed to establish the incidence of abnormal OGD findings in our bariatric population, and determine the rate at which these findings alter surgical management.

**Methods:** An observational, retrospective study of all patients undergoing OGD as part of routine bariatric workup over a two-year period (2013–2015) in a tertiary bariatric centre. Endoscopy reports and clinic letters were reviewed for all patients.

**Results:** Out of a total of 409 OGDs, 310 (75.7%) were reported as abnormal. The most common findings were hiatus hernia (49.4%), gastritis (36.9%), oesophagitis (6.8%), gastric polyps (4.4%), duodenitis (4.2%), gastric ulceration (3.7%), and Barrett's oesophagus (1.7%). There were 364 patients where it was possible to establish the effect that the OGD result had had on their management. Of these, 39 (10.7%) had a change to their surgical management plan, 3 (0.08%) incurred a delay to surgery, and 322 (88.5%) had no change.

**Conclusion:** Given the high incidence of clinically and surgically relevant findings on preoperative OGD in bariatric patients, in both procedural approach and timing, we recommend the routine investigation of all patients.

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## P33

**Improving UK long term follow up of bariatric surgery patients**

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**Background:** Patients with severe and complex obesity, who undergo bariatric surgery, require access to long term support and follow-up. NICE CG183 obesity states that patients require lifelong follow-up and that long term data should be collected. Currently, many bariatric centres are only commissioned to provide two year follow-up with care then being returned to primary care. Many primary care staff doubt they have the expertise to provide long term follow-up. This potentially leaves patients at risk as they may not have access to appropriate and timely monitoring and action. A NCEPOD report in 2012 identified significant problems and made recommendations about patient follow-up.

**Methods:** A national working group set up a sub-group to develop follow-up guidelines. The multi-professional membership included surgeon, dietician, nurse, physician, general practitioners, patient representatives and commissioner. The group discussed the requirements of long term follow-up and proposed possible models of shared care. In addition, the national working group which includes commissioners was consulted.

**Results:** The working group has produced guidelines for the follow-up of bariatric surgery patients. These include models of shared care between specialist centres and primary care. Following endorsement by the CRG, the guidelines will be launched and shared with clinical commissioners.

**Conclusion:** The guidelines will help to improve the long term follow-up of bariatric surgery patients, reporting of data and the knowledge base and expertise of primary care health professionals. Further work is needed on the education and training of health care professionals.

### P34

#### Zinc and Copper abnormalities following Roux- en -Y Gastric Bypass (RYGB)

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**Background:** Recent Nutrition guidelines from BOMSS recommend annual zinc and copper testing. We analysed the incidence of these abnormalities in a population of patients following RYGB.

**Methods:** 99 consecutive patients attending annual review had plasma zinc and total copper levels checked. Reference ranges from local laboratories were used to determine our results. All patients were asked if they were compliant with our recommendation of one multivitamin and mineral A-Z daily.

**Results:** 97 patients were taking appropriate supplements. Variable results were observed. Normal zinc and copper levels in 31 (31.3%), low zinc and normal copper 47 (47.5%), low zinc and high copper 14 (14.1%) and high copper and normal zinc 7 (7.1%). After closer inspection most were only marginally abnormal. When accepting a 10% tolerance 32% had low zinc and 4% high copper. We had no incidence of low copper. With the exception of one all patients were clinically well.

**Conclusion:** 69% of patients had abnormal results on one multivitamin. Further work is needed however based on these results clinical judgement could be used to assess the need for copper testing. We would question the need for routine copper testing. Twice daily multi vitamins would be recommended in those with a proven zinc deficiency.

### P35

#### Small bowel obstruction post laparoscopic bariatric gastric bypass; Thinking of internal herniation . . . .Think twice!!

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**Background:** Obesity is becoming a worldwide problematic trend with major burden, to the individuals and to the health service. Surgical interventions are proven to be one of the most effective ways of treating obesity and its associated metabolic disorders. One of the most common surgical procedures is laparoscopic Roux en Y gastric bypass (LRYGB). Small bowel obstruction post

LRYGB is a known complication, commonly caused by Peterson's space internal herniation.

**Methods:** case presentation of a 58 year old male admitted acutely with small bowel obstruction. His background history includes: 1- previous Gastric bypass for bariatric purpose 2008 proceeded by intra-gastric balloon in 2007 where a weight loss of 57 Kgs where successfully achieved since 2008. 2- Acute surgical admission 10 months previously with acute abdomen, sepsis and lactic acidosis. Diagnosis of perforation in the upper abdomen was made and he was treated conservatively with IV antibiotics because CT scan with oral contrast revealed no leak from his bypass and he was improving clinically with conservative management. During his current admission, the patient showed clinical and radiological signs of bowel obstruction. A CT scan showed mechanical small bowel obstruction with a whirled appearance of the mesenteric vessels raising the possibility of Peterson's space internal herniation and the transition point was found in the mid small bowel.

**Results:** The patient was taken to theatre for laparoscopy where there was no evidence of internal herniation but the cause of the obstruction was found to be multiple small bowel loops adherent to the proximal transverse colon sealing off a site of previous diverticular perforation. Right hemicolectomy was performed with side to side anastomosis. The patient made an excellent uneventful recovery and was discharged home at day 10.

**Conclusion:** Although the internal herniation post LRYGB is considered the commonest aetiology of bowel obstruction, other less common causes must be considered particularly in the presence of unusual surgical history that could be linked to the current problem.

### P36

#### Laparoscopic Mini gastric bypass associated with a lower serum Selenium level in comparison with Roux-en-Y gastric bypass?

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**Background:** Selenium deficiency is a possible complication following some bariatric procedures. The aim of this prospective audit was to compare the serum Selenium levels after Laparoscopic Roux-en-Y gastric bypass (LRYGB) with that seen after Laparoscopic Mini gastric bypass (LMGB).

**Methods:** A retrospective comparison of prospectively collected Selenium values after LRYGB & LMGB was carried out. The data are presented as median (interquartile range-IQR). Mann-Whitney U test was used for groups comparisons and Chi Square test for categorical values. A p value of 0.05 was considered statistically significant.

**Results:** Between June 2015 and August 2015, 121 consecutive patients (92 female) underwent 99 LRYGB and 22 MGB procedures. All patients were advised to take one multivitamin tablet daily after surgery. At one year follow up, 57% of the patients in the LRYGB group (n =44) had normal serum Selenium levels in comparison with 50% in the LMGB group (n =12) (p = 0.925). There was no significant difference in the serum Selenium values; 0.9 (0.8-1.1) µmol vs. 0.9 (0.7-1.0) µmol, in the LRYGB vs. LMGB group, respectively, p 0.379. At 2 years postoperatively; 73% of the patients in the LRYGB group (n =55) had normal serum selenium levels in comparison with only 40% in the LMGB group (n =10) (p = 0.065). Similarly the serum levels were higher in the LRYGB group 1.0 (0.9-1.1) µmol in comparison with the LMGB group 0.8 (0.8-1.0) µmol but this has failed to reach statistical significance, p 0.434.

**Conclusion:** A trend towards lower serum selenium levels was observed in the LMGB in comparison to LRYGB at 2 years postoperatively. Our current unit protocol for nutritional supplementation after LRYGB seems adequate but consideration could be given to increasing the dose to two multivitamin tablets a day for patients undergoing LMGB. Routine testing is not required.

### P37

#### Novel bariatric procedures – a review

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**Background:** Bariatric and metabolic surgery has been shown to improve life expectancy, quality of life and obesity related co-morbidities. Over the last ten years, novel and less invasive procedures have been described.

**Methods:** A review of the literature regarding these procedures was performed.

**Results:** Numerous novel techniques have been described. Over the last 2 years, some randomized controlled trials have been published. New procedures can be divided into 3 groups:

1. Endoscopic procedures that have been developed to deal with acute complications of bariatric surgery – these include the use of stents, endoscopic suturing and tissue glue to deal with post-op leaks.
2. Procedures to induce weight loss as primary treatment. Some of these procedures try to simulate established bariatric operations including attempting to produce gastric restriction (endoscopic gastropexy and intra-gastric balloons), attempting to bypass the duodenum (duodeno jejunal bypass sleeve) or interfere with duodenal mucosa (duodenal resurfacing). Other novel procedures include vagal nerve stimulation and aspiration technology.

These procedures can be used for lower BMI patients and patients at high risk for conventional bariatric procedures. They may also be used as bridge to therapy.

3. Procedures that can be used to treat weight regain after primary bariatric surgery. Several endoscopic devices have been developed to attempt to restore pouch/sleeve size or decrease the diameter of gastrojejunal anastomosis for weight regain in gastric bypass – these include the use of endoscopic suturing devices and APC. These technologies could be used earlier rather than later in the patients' weight regain curve.

**Conclusions:** Novel procedures continue to evolve and may reduce morbidity and allow greater access to therapy. Further research and development are required to identify cost, long-term effectiveness and the place of such procedures. Bariatric surgeons are best placed to lead on the introduction of such technology. Outcomes and complications of these procedures need to be included in national databases.

### P38

#### Kwashiorkor in the Home Counties? Severe Protein Energy Malnutrition following Roux En Y Gastric Bypass

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**Introduction:** We report a case of protein energy malnutrition (PEM) following gastric bypass surgery with significant post operative complications. PEM results from inadequate protein intake and is common in resource-poor countries. It may be under-recognized in developed countries. Review of the literature reveals 3 reported case of PEM following bariatric surgery.<sup>1,2,3</sup>

**Case Presentation:** A 26-year old woman, BMI 42 kg/m<sup>2</sup> underwent Roux en y gastric bypass after Tier 3 intervention. With no past history of eating disorder or malabsorption, preoperatively she was nutritionally replete, with normal FBC, Hb, indices and serum albumin. Her procedure was complicated by pancreatitis, cholecystitis and ultimately she underwent laparoscopic cholecystectomy 4 months after bypass. Anorexic and fatigued with loose pale stools,

she became progressively unwell culminating in admission 7 months post bypass. She had severe facial, digital and peripheral oedema with a profound proximal myopathy, along with ataxia, patchy alopecia, gingivitis and angular stomatitis.

**Investigation:** Hb 99 g/L, MCV 110.8 fl, albumin 28 g/L, total protein 55 g/L, Corrected Calcium 2.10 mmol/L. Micronutrient screen and faecal elastase still pending. Echocardiogram and chest x ray normal. Albumin/Creatinine ratio normal.

**Progress:** She began nasogastric semi-elemental feeds, human albumin solution and IV vitamin B complex. Her oedema is resolving with a weight decrease from 75.5- 62.9 kg on day 5 (est. dry weight 63 kg) Her metabolic derangement is progressively improving. It is anticipated NG feeding will continue for 12 weeks and a full recovery is anticipated.

**Conclusion:** PEM is an uncommon but serious complication of bariatric surgery, presenting with oedema out of proportion to albumin levels. Bariatric teams should be aware of the early signs of PEM since recognition and prompt treatment can reduce morbidity. Careful clinical and nutritional follow-up is recommended to prevent nutritional complications.

### P39

#### Study on peri-operative management of type 2 diabetes following bariatric surgery

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**Background:** Increasingly patients with type 2 diabetes (T2DM) are undergoing bariatric surgery. The glycaemic response peri-operatively is variable and this study aimed to determine glycaemic control and insulin management peri-operatively.

**Methods:** This retrospective study included patients with T2DM (n = 70) who underwent bariatric surgery from 2011 to 2015. Glycaemic data were collected 24–48 hours post-surgery and 3 months post-surgery.

**Results:** Mean ( $\pm$  SD) age was 51 years  $\pm$  9.9, HbA1c 8%  $\pm$  1.7, weight 145 kg  $\pm$  26, BMI 51  $\pm$  7.7, duration of diabetes 6.0  $\pm$  5.1 years. Bariatric procedures were as follows: 13 gastric bands, 38 sleeve gastrectomies, 19 gastric bypasses. Pre-operatively, 46 patients were on oral hypoglycaemic medication alone, 19 on basal insulin +/- oral hypoglycaemics and 1 on diet alone. Median (range) total daily dose of insulin pre-operatively was 126 (10–290) units, reduced to 42 (9–110) units 24 hrs post-operatively (p < 0.05) and 7.5 (0–91) units 48 hrs post-operatively (p < 0.05). 40/65 patients continued metformin on discharge. At 3 months, mean ( $\pm$  SD) HbA1c decreased from 8%  $\pm$  1.7 to 7%  $\pm$  1.9. Insulin dose requirements reduced from 1.0  $\pm$  0.7 units/kg body weight to 0.4  $\pm$  0.4 units/kg body weight at 3 months. 7/19 patients stopped insulin on discharge (3 gastric bands, 3 sleeve gastrectomies and 1 gastric bypass) and 1 stopped at 3/12 (gastric bypass). Insulin requirements were reduced by approximately 2/3 within 48 hours of surgery. Those who stopped insulin had a mean duration of diabetes of 8.4 years pre-operatively versus 12.3 years for those who needed to continue insulin post-operatively. Mean ( $\pm$  SD) HbA1c was similar in both groups pre-operatively (9%  $\pm$  1.8).

**Conclusions:** Considerable insulin titration and monitoring is required peri-operatively for patients with T2DM who have undergone bariatric surgery. For patients with persistent hyperglycaemia post-surgery, we recommend starting on 1/3 rd of pre-operative total daily dose of insulin with close follow-up.