

The United Kingdom National Bariatric Surgery Registry

PUBLICATION OF SURGEON-LEVEL DATA IN THE PUBLIC DOMAIN FOR BARIATRIC SURGERY IN NHS ENGLAND

Summary

The NBSR Committee on behalf of the British Obesity and Metabolic Surgery Society presents the operative outcomes data for NHS patients having primary bariatric surgery for the financial year 2012/13. The main results are:

- 106 consultant surgeons contributed to the NBSR and the total number of primary operations recorded was 4,389
- 101 surgeons consented to their data being released (95%)
- The average body mass index (BMI) for the patients was 50.6 kg/m² and the average weight was 141 kg, indicating that the patients were twice the ideal weight for their height, and 72.8% were female
- The average number of obesity-related diseases for each patient, for example type 2 diabetes, hypertension and sleep apnoea, was 3.6
- There were 3 recorded deaths for an in-hospital mortality rate of 0.07%, equivalent to a survival rate of 99.93%
- The average length of hospital stay for all operations was 2.5 days
- There were no potential statistical outliers for mortality or length of stay.

Using Hospital Episode Statistics (HES) codes we estimate that there were 138 NHS surgeons doing bariatric surgery in the 11 months April 2012 – February 2013, and 5,656 operations were recorded. Therefore most bariatric surgeons (77%) were entering data and the great majority of NHS patients (up to 78%) were being recorded into the Registry.

According to HES we estimate that the overall in-hospital mortality rate for bariatric surgery was 0.11% for the 4 financial years 09/10 to 12/13 ¹, equivalent to a survival rate of 99.89%, validating the very low mortality from

¹ Includes latest available HES data up to the end of February 2013, therefore any mortality occurring in March for patients operated in February would not be detected, therefore the figures given could potentially underestimate the overall mortality.

bariatric surgery recorded by the consultant surgeons contributing to the NBSR.

In this report we have not been able to include bariatric surgery done as a revision procedure (to revise a previous bariatric surgical operation). Also, submission of data to the NBSR has been voluntary for surgeons up until April 2013. Although for these two reasons, and probably others, our case ascertainment (the proportion of NHS operations recorded out of the total done) is not complete, it seems that the survival rates in the NBSR are an accurate reflection of overall practice.

In-hospital survival from bariatric surgery is at least as good if not better than many common laparoscopic gastrointestinal procedures.

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NBSR Committee
30th June 2013

Background

In December 2012 the Commissioning Board for NHS England announced that it would require publication of surgeon-level outcomes data in 10 specialties, including bariatric surgery, by the summer 2013 ¹. The mandate to publish individual surgeon results has largely come from the legacies of the Kennedy Report (2001) ² that dealt with the adverse cardiac surgery outcomes in Bristol and more recently the Mid Staffordshire enquiry that culminated in the Francis Report (2013) ³.

The institutional failings found in both reports highlighted a need for more clarity about individual surgeon outcomes. We note that the Executive summary of the Francis report used the phrase ‘openness, transparency and candour’ 9 times and each of these words separately on numerous other occasions – part of the inevitable momentum towards specialist societies being aware of the outcomes results of their members in a process of encouraging continuous quality improvement.

NATIONAL BARIATRIC SURGERY REGISTRY

The NBSR Committee and bariatric surgeons – BOMSS – entirely accept the culture of being open and transparent about outcomes data. In fact, as far back as 2009 three specialist societies, the Association of Laparoscopic Surgeons, the Association of Upper Gastrointestinal Surgeons, and BOMSS set up the NBSR specifically for this purpose. Since then more than 30,000 patient records have been entered, and we have already published a first report of the overall outcomes, with very low mortality, in over 8,000 patients (April 2011) ⁴.

Bariatric surgery is an area of healthcare that is very much in the public eye and this is likely to continue to be the case. However, the NBSR does not currently receive public funding and this has added to the challenges of producing this report within a very short timescale. Therefore we have been limited to presenting one main outcome – mortality.

UNIT DATA VERSUS INDIVIDUAL SURGEON REPORTING

The Commissioning Board – NHS England – called for publication of individual surgeon-level outcomes. Our preference was to present outcomes data from *units*, since it is units that are commissioned to deliver services to patients, *not* individual surgeons.

We want to take the opportunity to highlight the fact that bariatric surgery is just one aspect of a multidisciplinary team (MDT) process of care that involves a wide range of healthcare professionals dedicated to the care of patients with severe and complex obesity. These include dietitians, specialist nurses, psychologists, bariatric physicians, anaesthetists, theatre teams and recovery staff, ward nurses including high dependency and intensive care nurses, out patient staff, radiographers, radiologists and exercise therapists.

The close working and performance of the whole MDT is integral to the overall outcome. The NCEPOD report in October 2012 highlighted the importance of team working⁵. Pragmatically it is difficult to measure and even more difficult to record in a format such as a registry.

ADMINISTRATIVE SUPPORT FOR DATA ENTRY AND VALIDATION

Currently, most NHS bariatric units don't have sufficient administrative support to ensure completeness of data entry and *internal* validation. As the NBSR became mandatory for NHS providers from 1st April of this year, we now look to commissioners and hospitals to address this issue. We are committed to ensuring accurate and complete data.

Recognising that lack of support could have led to missing records, incomplete records or inaccurate data entry and thus possible under-reporting of complications such as 30-day return to theatre rates, we had to take a view on the outcomes to analyse and present. It has limited the outcomes to those we are confident to publish, due to shortage of time and resources for *external* validation of submitted data.

POTENTIAL DIFFICULTIES WITH PUBLISHING INDIVIDUAL SURGEON-LEVEL DATA

There are many potential problems and pitfalls with publishing individual surgeon data, including incorrectly identifying the performance of a particular surgeon as below par due to inaccurate or missing data entry, or failing to capture all aspects of the patient's care in the Registry dataset. Individual surgeon volume must also be interpreted with caution since units may only start surgery part way through an analysis period or a surgeon may stop operating if they retire or a service is moved elsewhere as part of NHS service changes. Surgeons may also operate on NHS patients in 2 or more hospitals so that one unit's activity may not reflect the overall workload of an individual.

There is also the possibility of a competent surgeon apparently being seen to be an outlier in one particular time period when over a longer time period he/she would be seen to have completely satisfactory results. A recent debate at the Association of Surgeons meeting outlined these principles and highlighted the issues⁶.

HOSPITAL EPISODE STATISTICS CODING

At least 51 different OPCS4 codes are used to define the range of bariatric surgical procedures, but not a single one accurately describes Roux en Y gastric bypass, the operation that accounts for 2/3rds of NHS procedures. We would like to influence coding practice and standardise the HES codes used for bariatric surgery. However, HES recording has previously shown that the mortality within 30 days of surgery in the UK for the financial years 2000-08 was 0.27% (19/6953) patients⁷, so it seemed reasonable to compare

and validate our NBSR mortality data – the most important surgical outcome – with current data from HES.

Further limitations of HES include the inability to risk-adjust, since two of the variables need to assess risk, body mass index (BMI) and hypertension, are either not recorded or the recording is unreliable. Also, HES does not reliably distinguish between primary surgery and elective revisional surgery. All these are necessary for risk adjustment. Furthermore, the named consultant listing the patient for the operation may not be the same as the one operating. In contrast, the NBSR dataset captures all these variables and is accepted as the standard by bariatric surgeons to produce meaningful data.

Methodology for the June 2013 Reporting

The NBSR Committee asked for explicit consent for publication from each contributing consultant, recognising the inherent conflict with the Data Protection Act 1998 regarding the ownership of voluntarily submitted data and the current mandate to present individual surgeon-level outcomes.

We have also published a policy on how to manage potentially outlying data, available on the BOMSS website <http://www.bomss.org.uk/audit.htm>.

Although the NBSR dataset captures much more information, we decided due to the limitations of data validity to limit the *hard* outcomes published to surgeon volume, in-hospital mortality and length of stay. Eight outcomes in all are presented for the year 1st April 2012 – 31st March 2013:

- Consultant workload for primary operations (total number of operations)
- Operation split by consultant
- BMI on entry into the weight loss programme
- Co-morbidity count per type of operation (number of co-morbidities recorded per patient)
- Obesity-Surgery Mortality Risk Score (OS-MRS) and class per operations and overall per consultant
- Initial BMI overall per consultant (box and whiskers)
- Length of stay for primary procedures compared to the rest per consultant
- In-hospital mortality, described as survival

The co-morbidity count was taken from the NBSR dataset of co-morbidities:

- Type 2 diabetes
- Hypertension on treatment
- Dyslipidaemia
- Atherosclerosis (includes angina, MI, CABG, stroke, claudication)
- Sleep apnoea

- Asthma
- Functional status (presence of comorbidity defined as unable to climb 3 flights of stairs without resting)
- Back or leg pain from arthritis
- GORD
- Liver disease (suspected NAFLD or worse)
- Poly-cystic ovarian syndrome (female patients only)
- Depression (clinically significant depression as a reason for bariatric surgery)

The Obesity Surgery-Mortality Risk Score is the only validated measure of operative risk for patients undergoing bariatric surgery⁸. A point is added for each of the following risk factors that are present, up to a maximum of 5 points: age at surgery ≥ 45 years, BMI ≥ 50 kg m², male gender, recorded hypertension, one or more known risk factors for deep vein thrombosis (DVT) / pulmonary embolism (PE). Using the resultant score, complication & mortality rates can be risk-adjusted; the higher the score/group, the greater the risk of surgery. Patients can be stratified for risk according to how many of these risk factors are present. It is normal practice to refer to the calculated scores in three groups:

Group A (0-1 points)

Group B (2-3 points)

Group C (4-5 points)

The data were harvested for this analysis at 11am on 14th May 2013 by Dendrite Clinical Systems Ltd, the NBSR software provider. The data were assessed for obvious validation errors and erroneous data entry such as duplicate errors. Any data that looked as if they might be duplicate entries were reported to the individual units and consultants for validation and review. Where no response was obtained from the responsible unit or consultant, duplicate patient records were omitted from analysis on a 'least data entered record' basis. Each consultant was invited to review the individual data online before the publication date.

We worked with the Quality Outcomes Research Unit in Birmingham University (QUORU) to analyse the available HES data, and using a refined set of OPCS4 codes were able to estimate the mortality for primary bariatric surgery for the 4 years April 2009 – February 2013 (D McNulty, D Pagano unpublished). Due to time limitations we were not able to analyse HES data for any other potential outcome.

Presentation of results

To minimise the possibility of error and because we are reporting only primary surgery we do not attempt to present individual unit data on case

ascertainment (proportion of patients entered on the NBSR) but present instead overall numbers. We recognise that the data presented for surgeons doing 10 or fewer operations in the analysis period are not likely to be representative of a surgeon's overall practice.

Data for each outcomes variable is presented either as graphs, bar charts or box and whiskers graphs. Comments are included interpreting the results.

We make no attempt to comment on operating volumes for hospitals or individual surgeons in this report. This was beyond our scope as we are aware that several units have undergone personnel and location changes during the period, with new consultants being appointed or moving hospitals. These are additional reasons why individual surgeon data may not be representative of each surgeon's practice as a whole. Commissioners should refer to the April 2013 Commissioning Board for guidance on the minimum number of recommended volumes ¹⁰.

Results

The results can be found on the website <http://www.bomss.org.uk/audit.htm> and nbsr.e-dendrite.com.

MAIN DATA:

- The total number of operations recorded by 106 consultant surgeons contributing to the NBSR was 4,389
- 101 surgeons consented to their data being released (95%)
- There were 3 recorded deaths for an in-hospital mortality rate of 0.07%, equivalent to a survival rate of 99.93%
- The average body mass index (BMI) for the patients was 50.6 kg/m², median 49.9 (inter-quartile range 45.2-54.9 kg/m²), the average weight was 141 kg, indicating that the patients were twice the ideal weight for their height, and 72.8% were female
- The average number of obesity-related diseases for each patient, for example type 2 diabetes, hypertension and sleep apnoea, was 3.6
- The average length of hospital stay for all operations was 2.5 days
- There were no potential statistical outliers for mortality or length of stay.

FROM HES ANALYSIS:

- Using a refined set of codes we estimated from HES data that there were 138 NHS surgeons doing bariatric surgery in the 11 months April 2012 – February 2013, and 5,656 operations were recorded, indicating that 77% of bariatric surgeons entered data and up to 78% of NHS patients were recorded

- According to HES the total number of operations for the financial years 09/10 to 12/13 ² was estimated at 23,760 and we estimated there were 25 deaths for an overall in-hospital mortality rate of 0.11%, equivalent to a survival rate of 99.89%
- Both sets of data are entirely equivalent to a US benchmark, the American College of Surgeons Bariatric Surgery Center Network, where the published mortality rate was 0.12% (35 out of 28,616) for patients operated from 2007-10 ¹⁰.

ADDITIONAL NOTES:

We know that there is a high likelihood that the numbers for each surgeon presented here underestimate the overall volume of their surgery as we have not been able to include re-do surgery (done as a revision of a previous bariatric operation) due to the sheer complexity of analysis required. Many very experienced surgeons specialise in revision surgery and have particular expertise in this area and several have contacted us to make this clear.

We know that the reasons for those surgeons not consenting to their data being published were that their recorded data were incomplete and therefore underestimated the total volume of surgery. Given the very tight timescale for producing this report there was also not enough time to correct potentially erroneous data entry. There were concerns that their practice would be misrepresented as a result. Supporting documentation may be available on their websites, and as far as we know the details of their practices we are fully supportive of the quality of their work. None of these surgeons was a statistical outlier. We are also fully supportive of the practices, as far as we know the details, of the three surgeons who reported mortality in the analysis period, none of whom was a statistical outlier.

Several hospitals with their own established, pre-existing registries/databases attempted to submit their relevant data for merging and analysis alongside the data entered directly to the NBSR, but have been unable to for reasons beyond their control. The reasons include file formats being incompatible; lack of funding to transmit data or have it analysed at the receiving end; deadlines too tight logistically with timescales unworkable for the actual merging of data, and probably other reasons as well. These units / hospitals were:

- Chelsea and Westminster Hospital
- North Bristol / Southmead Hospital
- University Hospitals Leicester
- Western Sussex Hospitals

² Includes latest available HES data up to the end of February 2013, therefore any mortality occurring in March for patients operated in February would not be detected, therefore the figures given could potentially underestimate the overall mortality.

- Phoenix Health / Aintree University Hospital / Countess of Chester Hospital

Several or all of these units intend to publish their data on their own local websites.

We also had contact with:

- Imperial Weight Centre, which maintains its own database but was not able to provide the NBSR dataset requested in the timescale required due to administrative challenges with moving hospital site during the year 2012/13
- Barking, Havering and Romford Hospitals, who alerted us to the fact that the local Specialist Commissioners had stopped bariatric surgery in Queen's Hospital in Romford in April 2012, hence they were only able to report very few patients in the analysis period
- Princess Royal University Hospital, Orpington, part of South London Healthcare Trust; the Trust is due for reconfiguration and has so far not been able to submit data due to administrative reasons, however this is now being rectified
- North Tees University Hospital, Stockton-on-Tees, which started contributing patients to the NBSR after the analysis period
- Spire Regency Hospital, Macclesfield, Spire Fylde Coast, Blackpool and BMI Alexandra Hospital, Manchester, which did not have administrative support to enter complete data and perform internal validation of submitted data
- Royal Derby Hospitals, which has a large proportion of revision surgery, the data are not representative of their overall volume, and due to other administrative reasons their data for this report are not complete
- Several other units, including Oxford Bariatric Unit and Royal Berkshire Hospital, Reading, concerned that their data were not fully representative of their NHS practice as lack of administrative support and technical reasons meant they had missing data.

Interpretation of results

The data presented are a snapshot only of the overall process of bariatric surgery.

This report is part of an 'iterative process', that is, we expect the overall results to be updated continuously as more units are able to submit their data, and as the dataset evolves over time as part of an overall bariatric surgery quality improvement process. Surgeons who join mid-way through the audit process are continuing to back-populate the Registry and we are grateful to them for showing their commitment to this initiative.

We expect that patients will be able to use the data presented in the surgeon graphs to facilitate their consultations with the local bariatric team and help them make informed decisions about surgery.

Patients should be reassured that in-hospital mortality is extremely low after bariatric surgery: survival from bariatric surgery is at least as good if not better than many common laparoscopic gastrointestinal procedures.

NBSR Committee, 30th June 2013

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