Guidelines for the follow-up of patients undergoing bariatric surgery

O'Kane, Mary; Parretti, Helen; Hughes, Carly; Sharma, Manisha; Woodcock, Sean; Puplampu, Tamara; Blakemore, Alexandra; Clare, Kenneth; MacMillan, Iris; Joyce, Jacqueline; Sethi, Su; Barth, Julian

DOI:
10.1111/cob.12145

Appendix 1

When should GPs refer back in later stages?

Most patients will be getting on with their lives having no issues associated with their gastric surgeries however there are some later problems to watch out for which may require further investigation and referral back to the bariatric surgical service.

Technical / GI symptoms

- Gastric bands can slip, erode or develop leaks within the port or tubing (following a difficult band fill/defill) at any time
- Internal hernias following gastric bypass surgery are commoner 3-5 years post-surgery even if potential defects have been closed at the time of the primary surgery
- Reflux occurs in 10% of patients following a sleeve gastrectomy in patients with no previous history of reflux. Most settle with PPIs and time. Occasionally the sleeve gastrectomy may need to be converted to a gastric bypass
- If patients commence smoking and/or NSAID post operatively then they have an increase in peptic ulceration at an anastomosis or staple site. Smoking cessation, PPIs and sucralfate are the main stay of treatment. Rarely does an anastomosis need refashioning
- Constipation is often the result of a low fibre and / or insufficient fluid intake. Advice should be given on dietary sources of fibre and increased fluid intake. Laxatives may be required. It may be a symptom of an overtight band reflecting that the patient is unable to manage adequate fluid and fibre intake in which case the patient should be referred back
- Recalcitrant diarrhoea should be investigated. Diarrhoea and steatorrhoea are associated with the duodenal switch but may occur after gastric bypass. It can contribute to protein malabsorption and vitamin and mineral deficiencies. In some cases, pancreatic enzyme replacements are advised
- Vomiting should be investigated. Patients should not be experiencing frequent vomiting. Occasionally if a patient eats too fast, the wrong texture of food or eats too much, they may experience regurgitation. If this happens frequently following bariatric surgery it can be a sign of an overtight band or a stricture. The patient should be referred back and started on additional thiamine supplements meanwhile

Nutritional issues

- Post Prandial hypoglycaemia (PPH) is most often seen following a gastric bypass and needs the attention of a dietitian initially. Patients present with sweats, shaking and feeling dreadful following eating. If dietary education fails to resolve the symptoms further investigation by a bariatric physician or endocrinologist is recommended.
- Patients with poor weight loss or weight regain if re-referred should be discussed at a MDT, especially if revisional surgery is being considered.
- Patients with continued, excessive, weight loss require further investigations. The weight loss can be for a number of reasons including a greatly reduced appetite and psychological factors including fear of weight gain or diet progression. However, it may be unrelated to the bariatric surgery procedure. Further investigation and a referral back to the bariatric surgical service is advisable

- Peripheral oedema may be a symptom of protein malnutrition and require further investigation
- Night blindness can be a sign of vitamin A deficiency and can occur after gastric bypass and especially after duodenal switch
- Inadequate diet requiring bariatric dietitian advice
- Some weight regain over time is natural. Patients should be encouraged to continue lifestyle changes. Some patients may benefit from attending a local slimming group whilst others may require one to one dietetic support or referral back to a tier 3 weight management service

Pregnancy

- All patients who become pregnant should be referred to the obstetric consultant and invited to see the bariatric or local specialist team again to review their diet and multivitamins and defill gastric bands if nausea and vomiting become an issue

Other medical issues

The following conditions and symptoms may require referral to a bariatric physician:

- Renal colic, renal stones (need to be investigated for post bariatric surgery hyperoxaluria)
- Tiredness all the time, excessive bone pains, cracking of teeth/fractures
- Pins and needles despite normal levels of vitamin B12, folate (could be due to functional deficiency of vitamin B12 requiring specialized tests)
- Conditions requiring increased demand of vitamins and minerals - pregnancy, lactation, psoriasis etc
- Abnormal blood tests requiring specialist interpretation
- Newly diagnosed conditions like HIV, tuberculosis, warfarin therapy, chronic illness requiring long term medications e.g. post-transplant use of immunosuppressants, oral absorption of which might need to be considered and monitored in view of bariatric surgery

Psychological problems related to procedure

- Some patients may need additional long term psychological support. There is an increased risk of addiction transfer, alcohol and substance misuse or suicide.

Appendix 2: Shared Care Protocols

Model 1: GP annual blood tests and comorbidities review model

In this model, the patient's care is shared between the specialist centre and the GP. This ensures that the patient has access to specialist advice and support. Capacity would need to be built into the specialist centres to accommodate annual reviews. Both the GP and the specialist centres need robust systems to ensure annual reviews take place.

Model 2: GP annual blood tests and comorbidities review plus model

In this model, the patient is followed up by GP only, with an annual nutritional review provided by the Tier 3 dietitian (and referral back if necessary). This nutritional review may be face to face or via a postal, telephone or electronic consultation. The GP needs a robust system to ensure the review takes place and timely information is sent to the specialist centre. The GP would also be charged with the responsibility of forwarding appropriate data back to the original surgical unit for entry to the NBSR.

Model 3: Specialist follow-up model

In this model, the patient is followed up by specialist team (usually a local Tier 3 service). There needs to be a robust recall system and the service must be commissioned and funded to enable annual review. There needs to be good communication with the GP. If the patient moves out of area, the care may need to be passed onto another specialist team. The specialist centre sends data to the original surgical unit for entry onto the NBSR.

Model 4: Joint appointments in primary care model

In this model, the patient is followed up jointly by specialist team and GP in the community. This ensures that the patient has access to specialist advice and support. Capacity would need to be built into the specialist centres staffing to accommodate annual reviews. Both the GP and the specialist centres need robust systems to ensure annual reviews take place. This enables knowledge and skills to be shared and may be more convenient for the patient. The specialist centre sends data to the original surgical unit for entry into the NBSR.

Model 1: GP annual bloods and comorbidities review model

SHARED CARE PROTOCOL
MANAGEMENT OF POST BARIATRIC SURGERY PATIENTS

GP ANNUAL BLOODS AND COMORBIDITIES REVIEW MODEL

OBJECTIVES

- To outline the referral criteria for shared-care, define the responsibilities of the bariatric surgical service (Tier 4), Tier 3 service, patient and GP.

REFERRAL CRITERIA

- Responsibility for care of the patient will only be shared when it is agreed by the specialist and the patient's primary care practitioner that the **patient's condition is stable**.

PROCESS FOR AGREEING SHARED CARE

- The request for shared care should include individual patient information, outlining all relevant aspects of the patients care and which includes individual information for future nutritional monitoring and supplementation for the patient. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be included.
- If the GP does not accept responsibility for shared care of the patient then he/she will inform the specialist of his/her decision in writing within 14 days.
- In cases where shared care arrangements are not in place, or where problems have arisen within the agreement and patient care may be affected, the responsibility for the patients' management including monitoring and prescribing remains with the specialist.
- The patient must be involved in the discharge decision and agree to the shared care arrangement.
- We recommend that the patient should be provided with written information regarding their long term follow-up and a patient contract be agreed and signed by the patient and discharging team.

CONDITION TO BE TREATED

Bariatric surgery is a recognised treatment option for patients with severe and complex obesity. For many patients, it is an effective tool in combination with dietary, behavioural and lifestyle changes in facilitating weight loss and improvement in medical comorbidities. The UK National Bariatric Surgery Registry (NBSR 2014) reported that between 2011 to 2013, 32,073 bariatric surgery operations were performed of which 76.2% were funded by the NHS.

Bariatric surgery impacts on dietary and nutritional intake and some procedures affecting the absorption on macro- and micronutrients. There is a serious risk of malnutrition if the patient is unable to comply with the nutritional guidelines, follow-up and aftercare. Patients may be at risk of protein malnutrition for instance from an overtight gastric band, anastomotic stricture, chronic diarrhoea/malabsorption or noncompliance with dietary advice. The incidence of iron deficiency anaemia and vitamin B12 deficiency is increased following the gastric bypass, sleeve gastrectomy and duodenal switch. Vitamin D deficiency is common in the obese population and the risk increases following bariatric surgery. Patients who undergo a duodenal switch are at additional risk of

developing deficiencies in fat soluble vitamins. Nutritional deficiencies are not an inevitable outcome of bariatric surgery and can be avoided with provision of the correct aftercare combined with patient compliance.

NATIONAL GUIDANCE

The NCEPOD report Too Lean a Service (2012) was critical of the initial post-operative care and made a number of recommendations. These included ensuring that the patient received clear post-operative dietary guidance; the GP received a timely discharge summary and plan and there was a clear, continuous long term follow-up plan involving all the appropriate health care professionals.

The NICE CG189 guidance on obesity emphasised the importance of regular post-operative follow-up with a minimum of two years in the bariatric surgical service. It was recommended that this follow-up should include dietary and nutritional assessment, advice and support; nutritional monitoring; review of comorbidities and medications; physical activity advice and support and individualised psychological support. It also states that following discharge from the bariatric surgical service, "there should be at least annual monitoring of nutritional status and appropriate supplementation according to need following bariatric surgery, as part of a shared care model of chronic disease management".

There is a requirement for the bariatric surgeons to submit data to NBSR. However, if patients are no longer under the care of the bariatric surgeon after two years, it is unclear how this data will be collected in the longer term.

CLINICAL INFORMATION

The British Obesity and Metabolic Surgery Society (BOMSS) has produced "Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery" and "GP Guidance: Management of nutrition following bariatric surgery". The Royal College of General Practitioners has produced "Ten top tips for the management of patients post bariatric surgery in primary care".

AREAS OF RESPONSIBILITY

Patient roles and responsibilities

- Take lifelong prescribed nutritional supplements.
- Follow the dietary and any other recommendations given by specialist team.
- Attend for follow-up appointments with specialist team or GP when arranged (annual review with each required).
- Provide follow-up information as needed.
- Seek help via GP if experiencing new symptoms or struggling to follow any recommendations you have been given.
- If patient moves he/she has a responsibility to inform their new GP of their history of bariatric surgery and requirement for shared care with a specialist service. It is also their responsibility to inform their current specialist service of their move so that they can transfer the patient's care to a new service in the area into which they intend to move.

- Inform their GP and Tier 3 team of their intention to become pregnant (or that they are pregnant).

Specialist service (Tier 4) roles and responsibilities

- Ensure that the GP is provided with a discharge summary that includes the procedure, any complications as well as the most recent results and management of co-morbidities. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be provided to the GP.
- The discharge summary sent to the GP by the Tier 4 service should also include information on the required monitoring blood tests, nutritional supplements and contact numbers for the patient.
- Identify whether a local Tier 3 service is willing to provide follow-up review appointments and if so, the same information contained in the GP discharge summary (above) should be sent to the Tier 3 service.
- Written confirmation to the GP of which specialist unit will be providing follow-up should also be included or alternatively, to which named local Tier 3 service care is being transferred.
- Continue to submit follow-up data to NBSR.

Specialist Tier 3 or 4 service undertaking follow-up care roles and responsibilities

- Perform an annual review that includes assessment of nutritional status, psychological health and any other complications identified from blood tests performed by GP.
- Perform an annual review of gastric band patients and perform band fills as appropriate.
- Submit required data to the original bariatric surgical service for entry into the National Bariatric Surgery Registry.
- Review patient at other times as requested by GP when concerns are identified.
- If patient should DNA appointment then the GP should be informed and the patient should be contacted to re-arrange the appointment.
- Inform the GP and Tier 4 team if the patient intends to or becomes pregnant.

GP roles and responsibilities

- Keep a register of all patients who have had a bariatric procedure.
- Continue to review chronic diseases such as diabetes, hyperlipidaemia and blood pressure annually.
- Perform annual blood tests as advised by BOMSS and RCGP guidance.
- Perform annual check of patient weight.
- Provide the Tier 3 or 4 services with the results of the annual blood tests, review and weight.
- Refer patient back to Tier 3 or 4 services if any new problems are identified (see BOMSS and RCGP guidance and list of problems at end of this document).
- If GP receives a letter informing them that patient has DNA an appointment with the specialist service then the patient should be contacted and advised to re-arrange the appointment (or re-refer the patient if needed).
- If patient fails to attend for a GP annual review appointment then the GP should contact the patient to invite them to attend (three attempts to contact should be made over 12 months and if no response this should be repeated annually).

- Inform the Tier 3 and 4 teams if the patient intends to become pregnant or informs them that they are pregnant.
- Inform the local obstetric team of the patient's history of bariatric surgery should the patient intend to or become pregnant.

SYMPTOMS THAT MAY REQUIRE RE-REFERRAL:

- *Difficulty swallowing and / or vomiting*
  This may be due to pouch or oesophageal dilation, band problems, scarring or ulcers and needs prompt investigation.

- *Abdominal pain*
  This may be related to hernias, gallstones or unrelated and needs assessing.

- *Heartburn / reflux*
  This may respond to simple medication but should be investigated if persists. Coughing at night or reflux on bending over may also signify this problem.

- *Infection at gastric band access port*
  Referral required unless it directly follows the surgery or a band fill injection and responds rapidly to antibiotics.

- *Weight regain or loss of restriction*
  Weight regain should be managed by appropriate dietary advice or support to develop healthy eating behaviours in the first instance. Re-referral or discussion with the specialist Tier 3 or 4 service should be considered if further surgery is an option.

- *Diarrhoea, abdominal pain after eating or drinking*
  This may indicate dumping syndrome. If it does not improve by eating small meals slowly and avoiding carbohydrates and fluids at the beginning of a meal, re-referral may be needed.

- *Sweating, dizziness after eating or drinking*
  This may be from post-prandial hypoglycaemia especially if provoked by high-glycaemic index foods or drinks. Re-referral is recommended for conformation of the diagnosis, exclusion of other causes and dietetic and medical advice.

- *Confusion, eye problems, hair loss, pins and needles and a wide variety of other disturbances*
  These can occur with vitamin and mineral deficiencies. This should be investigated and re-referral made if concerned.

- *Excess skin*
  Psychological or physical problems related to excess skin should prompt referral to plastic surgery service.

REFERENCES

British Obesity and Metabolic Surgery Society (BOMSS) (2014) Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery British Obesity and Metabolic surgery Society Available from:

http://www.bomss.org.uk/wp-content/uploads/2014/09/BOMSS-guidelines-Final-version1Oct14.pdf (accessed 01.02.15)

National Confidential Enquiry into Patient Outcome and Death.Too Lean a Service? A review of the care of patients who underwent bariatric surgery. London: Dave Terrey; 2012.

National Institute for Health and Clinical Excellence (NICE) (2014) Obesity: identification, assessment and management of overweight and obesity in children, young people and adults. National Institute for Health and Clinical Excellence. Available from: http://www.nice.org.uk/guidance/CG189 (accessed 01.02.15)

O'Kane M, Pinkney J, Aasheim ET et al (2014) Management of nutrition following bariatric surgery: GP guidance. Available from: http://www.bomss.org.uk/nutritional-guidelines/ (accessed 01.02.15)

Parretti HM, Hughes CA, O'Kane M, Woodcock S and RG Pryke (2014) Ten top tips for the management of patients post bariatric surgery in primary care. Available from: http://www.rcgp.org.uk/clinical-and-research/clinical-resources/nutrition/~/media/Files/CIRC/Nutrition/Obesity/RCGP-Top-ten-tips-for-post-bariatric-surgery-patients-in-primary-care-Nov-2014.ashx

AUTHORS

HM Parretti and CA Hughes

ACKNOWLEDGEMENTS

Sally Norton
Consultant Upper GI and Bariatric Surgery
North Bristol NHS Trust and University Hospitals Bristol Foundation Trust

Updated 21st March 2016

Model 2: GP annual bloods and co-morbidities review plus model

SHARED CARE PROTOCOL
MANAGEMENT OF POST BARIATRIC SURGERY PATIENTS

GP ANNUAL BLOODS AND COMORBIDITIES REVIEW PLUS MODEL

OBJECTIVES

- To outline the referral criteria for shared-care, define the responsibilities of the bariatric surgical service (Tier 4), Tier 3 service, patient and GP.

REFERRAL CRITERIA

- Responsibility for care of the patient will only be shared when it is agreed by the specialist and the patient's primary care practitioner that the **patient's condition is stable**.

PROCESS FOR AGREEING SHARED CARE

- The request for shared care should include individual patient information, outlining all relevant aspects of the patients care and which includes individual information for future nutritional monitoring and supplementation for the patient. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be included.
- If the GP does not accept responsibility for shared care of the patient then he/she will inform the specialist of his/her decision in writing within 14 days.
- In cases where shared care arrangements are not in place, or where problems have arisen within the agreement and patient care may be affected, the responsibility for the patients' management including monitoring and prescribing remains with the specialist.
- The patient must be involved in the discharge decision and agree to the shared care arrangement.
- We recommend that the patient should be provided with written information regarding their long term follow-up and a patient contract be agreed and signed by the patient and discharging team.

CONDITION TO BE TREATED

Bariatric surgery is a recognised treatment option for patients with severe and complex obesity. For many patients, it is an effective tool in combination with dietary, behavioural and lifestyle changes in facilitating weight loss and improvement in medical co-morbidities. The UK National Bariatric Surgery Registry (NBSR 2014) reported that between 2011 to 2013, 32,073 bariatric surgery operations were performed of which 76.2% were funded by the NHS.

Bariatric surgery impacts on dietary and nutritional intake and some procedures affecting the absorption on macro- and micronutrients. There is a serious risk of malnutrition if the patient is unable to comply with the nutritional guidelines, follow-up and aftercare. Patients may be at risk of protein malnutrition for instance from an overtight gastric band, anastomotic stricture, chronic diarrhoea/malabsorption or noncompliance with dietary advice. The incidence of iron deficiency anaemia and vitamin B12 deficiency is increased following the gastric bypass, sleeve gastrectomy and duodenal switch. Vitamin D deficiency is common in the obese population and the risk increases

following bariatric surgery. Patients who undergo a duodenal switch are at additional risk of developing deficiencies in fat soluble vitamins. Nutritional deficiencies are not an inevitable outcome of bariatric surgery and can be avoided with provision of the correct aftercare combined with patient compliance.

NATIONAL GUIDANCE

The NCEPOD report Too Lean a Service (2012) was critical of the initial post-operative care and made a number of recommendations. These included ensuring that the patient received clear post-operative dietary guidance; the GP received a timely discharge summary and plan and there was a clear, continuous long term follow-up plan involving all the appropriate health care professionals.

The NICE CG189 guidance on obesity emphasised the importance of regular post-operative follow-up with a minimum of two years in the bariatric surgical service. It was recommended that this follow-up should include dietary and nutritional assessment, advice and support; nutritional monitoring; review of comorbidities and medications; physical activity advice and support and individualised psychological support. It also states that following discharge from the bariatric surgical service, "there should be at least annual monitoring of nutritional status and appropriate supplementation according to need following bariatric surgery, as part of a shared care model of chronic disease management".

There is a requirement for the bariatric surgeons to submit data to NBSR. However, if patients are no longer under the care of the bariatric surgeon after two years, it is unclear how this data will be collected in the longer term.

CLINICAL INFORMATION

The British Obesity and Metabolic Surgery Society (BOMSS) has produced "Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery" and "GP Guidance: Management of nutrition following bariatric surgery". The Royal College of General Practitioners has produced "Ten top tips for the management of patients post bariatric surgery in primary care".

AREAS OF RESPONSIBILITY

Patient roles and responsibilities

- Take lifelong prescribed nutritional supplements.
- Follow the dietary and any other recommendations given by specialist team.
- Attend for follow-up appointments with GP when arranged (annual review).
- Engage with an annual nutritional review offered by the Tier 3 service (this could be face to face or via telephone, postal or electronic consultation).
- Provide follow-up information as needed.
- Seek help via GP if experiencing new symptoms or struggling to follow any recommendations you have been given.
- If patient moves he/she has a responsibility to inform their new GP of their history of bariatric surgery and requirement for shared care with a specialist service. It is also their responsibility to inform their current specialist service of their move so that they can transfer the patient's care to a new service in the area into which they intend to move.

- Keep GP and specialist services updated of any change to contact numbers.

Specialist service (Tier 4) roles and responsibilities

- Ensure that the GP is provided with a discharge summary that includes the procedure, any complications as well as the most recent results and management of co-morbidities. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be provided to the GP. The discharge summary sent to the GP should also include information on the required monitoring blood tests, nutritional supplements and contact numbers for the patient.
- Identify whether a local Tier 3 service is willing to provide follow-up review appointments and if so, the same information contained in the GP discharge summary (above) should be sent to the Tier 3 service.
- Written confirmation to the GP of which specialist unit will be providing follow-up should also be included or alternatively, to which named local Tier 3 service care is being transferred.
- Continue to submit follow-up data to NBSR.

Specialist Tier 3 or 4 service undertaking follow-up care roles and responsibilities

- Provide GP with protocol for annual review.
- Perform an annual review of the patient's dietary and nutritional intake.
- Review patient at other times as requested by GP when concerns are identified.
- If patient should DNA any appointment then the GP should be informed and the patient should be contacted to re-arrange the appointment.

GP roles and responsibilities

- Keep a register of all patients who have had a bariatric procedure.
- Continue to review chronic diseases such as diabetes, hyperlipidaemia and blood pressure annually.
- Perform annual blood tests as advised by BOMSS and RCGP guidance.
- Perform annual check of patient weight.
- Perform an annual review as per protocol provided by specialist service to include psychological health and screening for any complications.
- Submit required data to the original bariatric surgical service for entry into the National Bariatric Surgery Registry.
- Refer patient back to Tier 3 or 4 service if any new problems are identified (see BOMSS and RCGP guidance and list of problems at end of this document).
- If patient fails to attend the GP for an annual review appointment they should contact the patient to invite them to attend for such a review.
- If GP receives a letter informing them that patient has DNA an appointment with the specialist service then the patient should be contacted and advised to re-arrange the appointment (or re-refer the patient if needed). Three attempts to contact should be made over 12 months and if no response this should be repeated annually.
- Inform the Tier 3 and 4 teams if the patient intends to become pregnant or informs them that they are pregnant.
- Inform the local obstetric team of the patient's history of bariatric surgery should the patient intend to or become pregnant.

SYMPTOMS THAT MAY REQUIRE RE-REFERRAL:

- *Difficulty swallowing and / or vomiting*
  This may be due to pouch or oesophageal dilation, band problems, scarring or ulcers and needs prompt investigation.

- *Abdominal pain*
  This may be related to hernias, gallstones or unrelated and needs assessing.

- *Heartburn / reflux*
  This may respond to simple medication but should be investigated if persists. Coughing at night or reflux on bending over may also signify this problem.

- *Infection at gastric band access port*
  Referral required unless it directly follows the surgery or a band fill injection and responds rapidly to antibiotics.

- *Weight regain or loss of restriction*
  Weight regain should be managed by appropriate dietary advice or support to develop healthy eating behaviours in the first instance. Re-referral or discussion with the specialist Tier 3 or 4 service should be considered if further surgery is an option.

- *Diarrhoea, abdominal pain after eating or drinking*
  This may indicate dumping syndrome. If it does not improve by eating small meals slowly and avoiding carbohydrates and fluids at the beginning of a meal, re-referral may be needed.

- *Sweating, dizziness after eating or drinking*
  This may be from post-prandial hypoglycaemia especially if provoked by high-glycaemic index foods or drinks. Re-referral is recommended for conformation of the diagnosis, exclusion of other causes and dietetic and medical advice.

- *Confusion, eye problems, hair loss, pins and needles and a wide variety of other disturbances*
  These can occur with vitamin and mineral deficiencies. This should be investigated and re-referral made if concerned.

- *Excess skin*
  Psychological or physical problems related to excess skin should prompt referral to plastic surgery service.

REFERENCES

British Obesity and Metabolic Surgery Society (BOMSS) (2014) Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery British Obesity and Metabolic surgery Society Available from: http://www.bomss.org.uk/wp-content/uploads/2014/09/BOMSS-guidelines-Final-version1Oct14.pdf (accessed 01.02.15)

National Confidential Enquiry into Patient Outcome and Death.Too Lean a Service? A review of the care of patients who underwent bariatric surgery. London: Dave Terrey; 2012.

National Institute for Health and Clinical Excellence (NICE) (2014) Obesity: identification, assessment and management of overweight and obesity in children, young people and adults. National Institute

for Health and Clinical Excellence. Available from: http://www.nice.org.uk/guidance/CG189 (accessed 01.02.15)

O'Kane M, Pinkney J, Aasheim E T et al (2014) Management of nutrition following bariatric surgery: GP guidance. Available from: http://www.bomss.org.uk/nutritional-guidelines/ (accessed 01.02.15)

Parretti HM, Hughes CA, O'Kane M, Woodcock S and RG Pryke (2014) Ten top tips for the management of patients post bariatric surgery in primary care. Available from: http://www.rcgp.org.uk/clinical-and-research/clinical-resources/nutrition/~/media/Files/CIRC/Nutrition/Obesity/RCGP-Top-ten-tips-for-post-bariatric-surgery-patients-in-primary-care-Nov-2014.ashx

AUTHORS

HM Parretti and CA Hughes

ACKNOWLEDGEMENTS

Sally Norton
Consultant Upper GI and Bariatric Surgery
North Bristol NHS Trust and University Hospitals Bristol Foundation Trust

Updated 21st March 2016

Model 3: Specialist follow-up model

SHARED CARE PROTOCOL
MANAGEMENT OF POST BARIATRIC SURGERY PATIENTS

SPECIALIST FOLLOW-UP MODEL

OBJECTIVES

- To outline the referral criteria for shared-care, define the responsibilities of the bariatric surgical service (Tier 4), Tier 3 service, patient and GP.

REFERRAL CRITERIA

- Responsibility for care of the patient will only be shared when it is agreed by the specialist and the patient's primary care practitioner that the **patient's condition is stable**.

PROCESS FOR AGREEING SHARED CARE

- The request for shared care should include individual patient information, outlining all relevant aspects of the patients care and which includes individual information for future nutritional monitoring and supplementation for the patient. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be included.
- If the GP does not accept responsibility for shared care of the patient then he/she will inform the specialist of his/her decision in writing within 14 days.
- In cases where shared care arrangements are not in place, or where problems have arisen within the agreement and patient care may be affected, the responsibility for the patients' management including monitoring and prescribing remains with the specialist.
- The patient must be involved in the discharge decision and agree to the shared care arrangement.
- We recommend that the patient should be provided with written information regarding their long term follow-up and a patient contract be agreed and signed by the patient and discharging team.

CONDITION TO BE TREATED

Bariatric surgery is a recognised treatment option for patients with severe and complex obesity. For many patients, it is an effective tool in combination with dietary, behavioural and lifestyle changes in facilitating weight loss and improvement in medical comorbidities. The UK National Bariatric Surgery Registry (NBSR 2014) reported that between 2011 to 2013, 32,073 bariatric surgery operations were performed of which 76.2% were funded by the NHS.

Bariatric surgery impacts on dietary and nutritional intake and some procedures affecting the absorption on macro- and micronutrients. There is a serious risk of malnutrition if the patient is unable to comply with the nutritional guidelines, follow-up and aftercare. Patients may be at risk of protein malnutrition for instance from an overtight gastric band, anastomotic stricture, chronic diarrhoea/malabsorption or noncompliance with dietary advice. The incidence of iron deficiency anaemia and vitamin B12 deficiency is increased following the gastric bypass, sleeve gastrectomy and duodenal switch. Vitamin D deficiency is common in the obese population and the risk increases following bariatric surgery. Patients who undergo a duodenal switch are at additional risk of

developing deficiencies in fat soluble vitamins. Nutritional deficiencies are not an inevitable outcome of bariatric surgery and can be avoided with provision of the correct aftercare combined with patient compliance.

NATIONAL GUIDANCE

The NCEPOD report Too Lean a Service (2012) was critical of the initial post-operative care and made a number of recommendations. These included ensuring that the patient received clear post-operative dietary guidance; the GP received a timely discharge summary and plan and there was a clear, continuous long term follow-up plan involving all the appropriate health care professionals.

The NICE CG189 guidance on obesity emphasised the importance of regular post-operative follow-up with a minimum of two years in the bariatric surgical service. It was recommended that this follow-up should include dietary and nutritional assessment, advice and support; nutritional monitoring; review of comorbidities and medications; physical activity advice and support and individualised psychological support. It also states that following discharge from the bariatric surgical service, "there should be at least annual monitoring of nutritional status and appropriate supplementation according to need following bariatric surgery, as part of a shared care model of chronic disease management".

There is a requirement for the bariatric surgeons to submit data to NBSR. However, if patients are no longer under the care of the bariatric surgeon after two years, it is unclear how this data will be collected in the longer term.

CLINICAL INFORMATION

The British Obesity and Metabolic Surgery Society (BOMSS) has produced "Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery" and "GP Guidance: Management of nutrition following bariatric surgery". The Royal College of General Practitioners has produced "Ten top tips for the management of patients post bariatric surgery in primary care".

AREAS OF RESPONSIBILITY

Patient roles and responsibilities

- Take lifelong prescribed nutritional supplements.
- Follow the dietary and any other recommendations given by specialist team.
- Attend for follow-up appointments with specialist team when arranged (annual review required).
- Provide follow-up information as needed.
- Seek help via GP if experiencing new symptoms or struggling to follow any recommendations you have been given.
- If patient moves he/she has a responsibility to inform their new GP of their history of bariatric surgery and requirement for shared care with a specialist service. It is also their responsibility to inform their current specialist service of their move so that they can transfer the patient's care to a new service in the area into which they intend to move.

Specialist service (Tier 4) roles and responsibilities

- Ensure that the GP is provided with a discharge summary that includes the procedure, any complications as well as the most recent results and management of co-morbidities. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be provided to the GP.
- The discharge summary sent to the GP should also include information on the required monitoring blood tests (for information only), nutritional supplements and contact numbers for the patient.
- Identify whether a local Tier 3 service is willing to provide follow-up review appointments and if so, the same information contained in the GP discharge summary (above) should be sent to the Tier 3 service.
- Written confirmation to the GP of which specialist unit will be providing follow-up should also be included or alternatively, to which named local Tier 3 service care is being transferred.
- Continue to submit follow-up data to NBSR.

Specialist Tier 3 or 4 service undertaking follow-up care roles and responsibilities

- Perform an annual review that includes annual blood tests, weight, assessment of nutritional status, psychological health and any other complications identified by patient or GP.
- Submit data to the National Bariatric Surgery Registry.
- Review patient at other times as requested by GP when concerns are identified.
- If patient should DNA appointment then the GP should be informed and the patient should be contacted to re-arrange the appointment.

GP roles and responsibilities

- Keep a register of all patients who have had a bariatric procedure.
- Continue to review chronic diseases such as diabetes, hyperlipidaemia and blood pressure annually.
- Refer patient back to Tier 3 or Tier 4 service if any new problems are identified (see BOMSS and RCGP guidance and list of problems at end of this document).
- If GP receives a letter informing them that patient has DNA an appointment with the specialist service then the patient should be contacted and advised to re-arrange the appointment (or re-refer the patient if needed). Three attempts to contact should be made over 12 months and if no response this should be repeated annually.
- Inform the Tier 3 and 4 teams if the patient intends to become pregnant or informs them that they are pregnant.
- Inform the local obstetric team of the patient's history of bariatric surgery should the patient intend to or become pregnant.

SYMPTOMS THAT MAY REQUIRE RE-REFERRAL:

- *Difficulty swallowing and / or vomiting*
  This may be due to pouch or oesophageal dilation, band problems, scarring or ulcers and needs prompt investigation.

- *Abdominal pain*
  This may be related to hernias, gallstones or unrelated and needs assessing.

- *Heartburn / reflux*

This may respond to simple medication but should be investigated if persists. Coughing at night or reflux on bending over may also signify this problem.

- *Infection at gastric band access port*
  Referral required unless it directly follows the surgery or a band fill injection and responds rapidly to antibiotics.

- *Weight regain or loss of restriction*
  Weight regain should be managed by appropriate dietary advice or support to develop healthy eating behaviours in the first instance. Re-referral or discussion with the specialist Tier 3 or 4 service should be considered if further surgery is an option.

- *Diarrhoea, abdominal pain after eating or drinking*
  This may indicate dumping syndrome. If it does not improve by eating small meals slowly and avoiding carbohydrates and fluids at the beginning of a meal, re-referral may be needed.

- *Sweating, dizziness after eating or drinking*
  This may be from post-prandial hypoglycaemia especially if provoked by high-glycaemic index foods or drinks. Re-referral is recommended for conformation of the diagnosis, exclusion of other causes and dietetic and medical advice.

- *Confusion, eye problems, hair loss, pins and needles and a wide variety of other disturbances*
  These can occur with vitamin and mineral deficiencies. This should be investigated and re-referral made if concerned.

- *Excess skin*
  Psychological or physical problems related to excess skin should prompt referral to plastic surgery service.

REFERENCES

British Obesity and Metabolic Surgery Society (BOMSS) (2014) Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery British Obesity and Metabolic surgery Society Available from: http://www.bomss.org.uk/wp-content/uploads/2014/09/BOMSS-guidelines-Final-version1Oct14.pdf (accessed 01.02.15)

National Confidential Enquiry into Patient Outcome and Death.Too Lean a Service? A review of the care of patients who underwent bariatric surgery. London: Dave Terrey; 2012.

National Institute for Health and Clinical Excellence (NICE) (2014) Obesity: identification, assessment and management of overweight and obesity in children, young people and adults. National Institute for Health and Clinical Excellence. Available from: http://www.nice.org.uk/guidance/CG189 (accessed 01.02.15)

O'Kane M, Pinkney J, Aasheim E T et al (2014) Management of nutrition following bariatric surgery: GP guidance. Available from: http://www.bomss.org.uk/nutritional-guidelines/ (accessed 01.02.15)

Parretti HM, Hughes CA, O'Kane M, Woodcock S and RG Pryke (2014) Ten top tips for the management of patients post bariatric surgery in primary care. Available from: http://www.rcgp.org.uk/clinical-and-research/clinical-resources/nutrition/~/media/Files/CIRC/Nutrition/Obesity/RCGP-Top-ten-tips-for-post-bariatric-surgery-patients-in-primary-care-Nov-2014.ashx

AUTHORS

HM Parretti and CA Hughes

ACKNOWLEDGEMENTS

Sally Norton
Consultant Upper GI and Bariatric Surgery
North Bristol NHS Trust and University Hospitals Bristol Foundation Trust

Updated 21st March 2016

Model 4: Joint appointments in primary care model

SHARED CARE PROTOCOLS
MANAGEMENT OF POST BARIATRIC SURGERY PATIENTS

JOINT APPOINTMENTS IN PRIMARY CARE MODEL

OBJECTIVES

- To outline the referral criteria for shared-care, define the responsibilities of the bariatric surgical unit service (Tier 4), Tier 3 service, patient and GP.

REFERRAL CRITERIA

- Responsibility for care of the patient will only be shared when it is agreed by the specialist and the patient's primary care practitioner that the **patient's condition is stable**.

PROCESS FOR AGREEING SHARED CARE

- The request for shared care should include individual patient information, outlining all relevant aspects of the patients care and which includes individual information for future nutritional monitoring and supplementation for the patient. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be included.
- If the GP does not accept responsibility for shared care of the patient then he/she will inform the specialist of his/her decision in writing within 14 days.
- In cases where shared care arrangements are not in place, or where problems have arisen within the agreement and patient care may be affected, the responsibility for the patients' management including monitoring and prescribing remains with the specialist.
- The patient must be involved in the discharge decision and agree to the shared care arrangement.
- We recommend that the patient should be provided with written information regarding their long term follow-up and a patient contract be agreed and signed by the patient and discharging team.

CONDITION TO BE TREATED

Bariatric surgery is a recognised treatment option for patients with severe and complex obesity. For many patients, it is an effective tool in combination with dietary, behavioural and lifestyle changes in facilitating weight loss and improvement in medical comorbidities. The UK National Bariatric Surgery Registry (NBSR 2014) reported that between 2011 to 2013, 32,073 bariatric surgery operations were performed of which 76.2% were funded by the NHS.

Bariatric surgery impacts on dietary and nutritional intake and some procedures affecting the absorption on macro- and micronutrients. There is a serious risk of malnutrition if the patient is unable to comply with the nutritional guidelines, follow-up and aftercare. Patients may be at risk of protein malnutrition for instance from an overtight gastric band, anastomotic stricture, chronic diarrhoea/malabsorption or noncompliance with dietary advice. The incidence of iron deficiency anaemia and vitamin B12 deficiency is increased following the gastric bypass, sleeve gastrectomy and duodenal switch. Vitamin D deficiency is common in the obese population and the risk increases following bariatric surgery. Patients who undergo a duodenal switch are at additional risk of developing deficiencies in fat soluble vitamins. Nutritional deficiencies are not an inevitable outcome

of bariatric surgery and can be avoided with provision of the correct aftercare combined with patient compliance.

NATIONAL GUIDANCE

The NCEPOD report Too Lean a Service (2012) was critical of the initial post-operative care and made a number of recommendations. These included ensuring that the patient received clear post-operative dietary guidance; the GP received a timely discharge summary and plan and there was a clear, continuous long term follow-up plan involving all the appropriate health care professionals.

The NICE CG189 guidance on obesity emphasised the importance of regular post-operative follow-up with a minimum of two years in the bariatric surgical service. It was recommended that this follow-up should include dietary and nutritional assessment, advice and support; nutritional monitoring; review of comorbidities and medications; physical activity advice and support and individualised psychological support. It also states that following discharge from the bariatric surgical service, "there should be at least annual monitoring of nutritional status and appropriate supplementation according to need following bariatric surgery, as part of a shared care model of chronic disease management".

There is a requirement for the bariatric surgeons to submit data to NBSR. However, if patients are no longer under the care of the bariatric surgeon after two years, it is unclear how this data will be collected in the longer term.

CLINICAL INFORMATION

The British Obesity and Metabolic Surgery Society (BOMSS) has produced "Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery" and "GP Guidance: Management of nutrition following bariatric surgery". The Royal College of General Practitioners has produced "Ten top tips for the management of patients post bariatric surgery in primary care".

AREAS OF RESPONSIBILITY

Patient roles and responsibilities

- Take lifelong prescribed nutritional supplements.
- Follow the dietary and any other recommendations given by specialist team (such as the Tier 3 or bariatric unit dietitian).
- Attend for joint follow-up appointments with specialist team (this could be via Skype) and GP when arranged (annual review required).
- Provide follow-up information as needed.
- Seek help via GP if experiencing new symptoms or struggling to follow any recommendations given.
- If patient moves he/she has a responsibility to inform their new GP of their history of bariatric surgery and requirement for shared care with a specialist service. It is also their responsibility to inform their current specialist service of their move so that they can transfer the patient's care to a new service in the area into which they intend to move.

Specialist service (Tier 4) roles and responsibilities

- Ensure that the GP is provided with a discharge summary that includes the procedure, any complications as well as the most recent results and management of co-morbidities. Details of procedure specific late complications that should trigger referral back to the bariatric surgical service should also be provided to the GP.
- The discharge summary sent to the GP should also include information on the required monitoring blood tests, nutritional supplements and contact numbers for the patient.
- Identify whether a local Tier 3 service is willing to provide follow-up review appointments and if so, the same information contained in the GP discharge summary (above) should be sent to the Tier 3 service.
- Written confirmation to the GP of which specialist unit will be providing follow-up should also be included or alternatively, to which named local Tier 3 service care is being transferred.
- Continue to submit follow-up data to NBSR.

Specialist Tier 3 or 4 service undertaking follow-up care roles and responsibilities

- Arrange for specialist staff to perform an annual review of the patient jointly with GP, at a community venue. This should include annual blood tests as advised by BOMSS and RCGP guidance, an annual check of patient weight, review of comorbidities, nutritional status, psychological health and any complications identified from blood results.
- Submit data to the original bariatric surgical service for entry into the National Bariatric Surgery Registry.
- Review patient at other times as requested by GP when concerns are identified.
- If patient fails to attend the annual review appointment they should attempt to contact the patient to invite them to attend.

GP roles and responsibilities

- Keep a register of all patients who have had a bariatric procedure.
- Organise required blood tests in advance of the annual review.
- Perform an annual review of the patient jointly with a specialist (could be a dietitian, specialist nurse or physician). This should include review of annual blood tests as advised by BOMSS and RCGP guidance, an annual check of patient weight, review of co-morbidities, nutritional status, psychological health and any complications identified from blood results.
- Refer patient back to Tier 3 or Tier 4 service at other times, if any new problems are identified (see BOMSS and RCGP guidance and list of problems at end of this document).
- If patient fails to attend the annual review appointment they should attempt to contact the patient to invite them to attend. Three attempts to contact should be made over 12 months and if no response this should be repeated annually.
- Inform the Tier 3 and 4 teams if the patient intends to become pregnant or informs them that they are pregnant.
- Inform the local obstetric team of the patient's history of bariatric surgery should the patient intend to or become pregnant.

SYMPTOMS THAT MAY REQUIRE RE-REFERRAL:

- *Difficulty swallowing and / or vomiting*
  This may be due to pouch or oesophageal dilation, band problems, scarring or ulcers and needs prompt investigation.

- *Abdominal pain*

This may be related to hernias, gallstones or unrelated and needs assessing.

- *Heartburn / reflux*
  This may respond to simple medication but should be investigated if persists. Coughing at night or reflux on bending over may also signify this problem.

- *Infection at gastric band access port*
  Referral required unless it directly follows the surgery or a band fill injection and responds rapidly to antibiotics.

- *Weight regain or loss of restriction*
  Weight regain should be managed by appropriate dietary advice or support to develop healthy eating behaviours in the first instance. Re-referral or discussion with the specialist Tier 3 or 4 service should be considered if further surgery is an option.

- *Diarrhoea, abdominal pain after eating or drinking*
  This may indicate dumping syndrome. If it does not improve by eating small meals slowly and avoiding carbohydrates and fluids at the beginning of a meal, re-referral may be needed.

- *Sweating, dizziness after eating or drinking*
  This may be from post-prandial hypoglycaemia especially if provoked by high-glycaemic index foods or drinks. Re-referral is recommended for conformation of the diagnosis, exclusion of other causes and dietetic and medical advice.

- *Confusion, eye problems, hair loss, pins and needles and a wide variety of other disturbances*
  These can occur with vitamin and mineral deficiencies. This should be investigated and re-referral made if concerned.

- *Excess skin*
  Psychological or physical problems related to excess skin should prompt referral to plastic surgery service.

REFERENCES

British Obesity and Metabolic Surgery Society (BOMSS) (2014) Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery British Obesity and Metabolic surgery Society Available from: http://www.bomss.org.uk/wp-content/uploads/2014/09/BOMSS-guidelines-Final-version1Oct14.pdf (accessed 01.02.15)

National Confidential Enquiry into Patient Outcome and Death.Too Lean a Service? A review of the care of patients who underwent bariatric surgery. London: Dave Terrey; 2012.

National Institute for Health and Clinical Excellence (NICE) (2014) Obesity: identification, assessment and management of overweight and obesity in children, young people and adults. National Institute for Health and Clinical Excellence. Available from: http://www.nice.org.uk/guidance/CG189 (accessed 01.02.15)

O'Kane M, Pinkney J, Aasheim ET et al (2014) Management of nutrition following bariatric surgery: GP guidance. Available from: http://www.bomss.org.uk/nutritional-guidelines/ (accessed 01.02.15)

Parretti HM, Hughes CA, O'Kane M, Woodcock S and RG Pryke (2014) Ten top tips for the management of patients post bariatric surgery in primary care. Available from: http://www.rcgp.org.uk/clinical-and-research/clinical-resources/nutrition/~/media/Files/CIRC/Nutrition/Obesity/RCGP-Top-ten-tips-for-post-bariatric-surgery-patients-in-primary-care-Nov-2014.ashx

AUTHORS

HM Parretti and CA Hughes

ACKNOWLEDGEMENTS

Sally Norton
Consultant Upper GI and Bariatric Surgery
North Bristol NHS Trust and University Hospitals Bristol Foundation Trust

Updated 21st March 2016

Appendix 3

BARIATRIC SURGERY ALERT CARD (EXAMPLE)

This patient had bariatric (weight loss) surgery with following details

Patient name: **DOB**

Type of surgery……

Date/s…….. Hospital……..

Nature of surgery- Restrictive/Restrictive and malabsorptive/Severe malabsorptive

Potential metabolic and nutritional challenges associated in postoperative period if adherence to lifelong nutritional supplements is poor/ patient has persistent severe diarrhoea, vomiting.

- Hypoglycaemia typically starting 9-10 months after bariatric surgery.
- Severe iron deficiency anaemia refractory to oral therapy (might require i.v. infusion/blood transfusion, severe copper deficiency might be present predisposing to iron deficiency anaemia.
- Severe vitamin B12 deficiency requiring frequent B12 injections (oral not absorbed)- folate supplements only to be given following normalization of B12 levels due to risk of precipitation of severe neurological complications.
- Severe vitamin A deficiency leading to night blindness and requiring frequent vitamin A infusions in lipid base
- Severe thiamine deficiency leading to symptoms of acute confusion, disorientation and mild psychosis (i.m. or i.v. thiamine injections without need to measure the levels in suspected cases)
- Hypocalcaemia secondary to hypomagnaesemia (correct magnesium prior to calcium correction)
- Calcium oxalate kidney stones because of increased oxalate reabsorption following the gastric bypass or if prolonged diarrhoea and poor hydration.
- Fracture and teeth loss if prolonged osteomalacia associated with severe vitamin D deficiency
- Surgical complications like bleeding, hernia, strangulation
- Severe vitamin K deficiency leading to raised APTT and bleeding risk (duodenal switch patients)

For more guidance, please refer to BOMSS nutritional guidelines at www.bomss.org.uk.

Contact details/bleep e.g. on call bariatric surgery registrar ……

Include diagram of surgical procedure