Title	**Multivitamin and Mineral Supplementation and monitoring following Bariatric Surgery: Guidance for Primary Care**
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Associated guidance	Patient Information Leaflets: Planning for privately funded Bariatric (weight loss) Surgery in the UK or abroad Over the Counter Multivitamins and Minerals Post NHS Bariatric Surgery
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Introduction

Bariatric surgery is the most clinically and cost-effective intervention for patients with severe or complex obesity. Whilst it is an important tool for weight management, dietary and behavioural changes are also needed to achieve good clinical outcomes, including weight loss maintenance (1). All bariatric procedures affect nutritional intake, and some procedures affect the absorption of macronutrients and / or micronutrients. Patients will be required to stay on lifelong nutritional supplements and have lifelong monitoring of their nutritional status.

To undergo bariatric surgery, the specialist bariatric team should ensure a comprehensive preoperative assessment of any psychological, dietary, behavioural, or other clinical factors that may affect adherence to postoperative care requirements (such as changes to dietary intake, eating habits and taking nutritional supplements) is carried out before performing surgery (2).

This guideline assumes that the **bariatric surgery centre will provide the first two years of follow up** for the patient before discharging back to the care of the General Practitioner as per NICE guideline CG246 (2). Certain patients such as those who have undergone a complex and severe malabsorptive surgical procedure e.g., duodenal switch / Biliopancreatic diversion (BPD) procedure requiring strict monitoring should remain under the care of a specialist bariatric surgery service for life. A re-referral should be made back to the bariatric

surgery department (or referral to the local unit if the original unit is now distant from where the patient is living) at any time if they have been lost to follow-up or if there are any concerns or complications. Follow-up guidance on monitoring and supplementation should be provided by the Bariatric Surgery Service in the discharge letter, and this should be followed. If follow up guidance was not received from the Bariatric Surgery Service after the patient was discharged, this should be requested.

This Norfolk and Waveney guidance is aimed at providing additional information for GPs and may be used if no follow-up guidance has been provided by the Bariatric Surgery Service, when the 2 year follow up period has ended, or the patient has received less than 2 years follow up after having privately funded Bariatric Surgery. This guideline does not replace shared care with a bariatric specialist team.

Weight loss procedures and impact on nutrition

The main bariatric surgery procedures are a sleeve gastrectomy (SG), and Roux en Y gastric bypass (RYGB), with a laparoscopic adjustable gastric band (LAGB) having become less common (historical or private patients are more likely to have had this procedure), and some patients having had a biliopancreatic bypass/duodenal switch (BPD/DS) (which are no longer performed). Some patients may have had a newer procedure such as a one anastomosis gastric bypass (OAGB or mini gastric bypass) or single anastomosis duodenal ileal bypass (SADI). Advice on management for these patients should be sought from a bariatric surgery unit.

After surgery patients are advised to start on a liquid diet, before progressing onto pureed food, soft food and then more normal textured food. At two years, the patient should be able to manage a wide range of textures of foods but may still report difficulties with some. It should not be assumed that all patients are eating a “well balanced” diet. Hopefully many will be, however some may have maladaptive eating behaviours resulting in a poor nutritional intake.

Impact of surgery on nutrition

Table 1: Surgical procedures and impact on nutrition

Surgical procedure	**Impact on nutrition**
Laparoscopic Adjustable Gastric Band (LAGB)	No impact on absorption. Over tight gastric band affects nutritional quality of diet including protein and iron
Sleeve Gastrectomy (SG)	May be some impact on absorption including iron, zinc, selenium, and vitamin B12
Roux en Y Gastric Bypass (RYGB)	Impacts on absorption of iron, zinc, copper, selenium, vitamin B12, folic acid, calcium and vitamin D. Long limb bypasses may affect absorption of protein, fat, vitamin A and trace elements in addition
Biliopancreatic Diversion/Duodenal switch (BPD/DS)	Impacts on absorption of protein, fat, calcium, Vitamin B12, folic acid, fat soluble vitamins A, D, E and K, zinc, copper, and selenium

Recommended nutritional supplements

All patients are recommended to take lifelong nutritional supplements in addition to having a balanced diet post-surgery. Patients should have this monitored regularly, i.e., through annual reviews. The patient's Bariatric surgery unit should provide full details of the patient's individual nutritional requirements and supplements. For further information, please refer to the British Obesity and Metabolic Surgery Society GP Hub (BOMSS GP Hub) and British Obesity and Metabolic Surgery Society (BOMSS) guidelines 2020 (1). Please note this information does not replace specialist advice from a Bariatric surgery unit.

Nutritional Supplements (routine):

Table 2: Routine nutritional supplementation post-surgery- see table 4 for recommended doses and forms

Nutritional supplement	**Surgical procedure**			
	LAGB	SG	RYGB	BPD/DS
A-Z Multivitamin and Mineral	Yes	Yes	Yes	Yes
Iron	No	Yes	Yes	Yes
Vitamin B12	No	Yes	Yes	Yes
Calcium and Vitamin D	No	Yes	Yes	Yes

Blood tests following surgery

Lifelong nutritional monitoring is essential to ensure prevention and appropriate treatment of nutritional deficiencies. However, it must be not assumed that abnormal blood results are always directly related to the surgery itself. The table below shows the recommended blood tests which should be done **annually as a minimum. In the first 2 years after surgery the bariatric centre will often request that these blood tests are done at the patient's GP practice if not possible at the bariatric centre**, the results should be sent to the specialists for review.

Table 3: Routine and optional annual blood tests following bariatric surgery (3)

LAGB	**Routine blood tests:** FBC, corrected calcium (bone profile if not available), LFTs, U+Es, vitamin B12 and folate, ferritin*, vitamin D **Optional blood tests for comorbidity monitoring or suspicion of deficiency (see information in next section for what to look for):** HbA1c and lipids, zinc, copper, selenium, vitamins E, A, or K1
SG, RYGB, BPD/DS	**Routine blood tests:** FBC, corrected calcium (bone profile if not available), LFTs, U+Es, vitamin B12 and folate, ferritin*, vitamin D, zinc, copper, selenium **Optional blood tests for comorbidity monitoring or suspicion of deficiency (see information in next section for what to look for):** HbA1c and lipids, vitamins E, A, or K1

*Low ferritin suggests iron deficiency, but high ferritin does not rule out iron deficiency (inflammation may raise ferritin levels). A complete iron profile may be more useful in this situation Note: a trace element vacutainer tube is needed for zinc, copper and selenium tests

Nutritional deficiencies – what to look for:

Protein malnutrition / protein energy malnutrition

Protein malnutrition can occur for several reasons including poor dietary choice, an over tight gastric band, anastomotic stricture, or protein malabsorption. It may present several years following surgery. Protein energy malnutrition is accompanied by oedema. In all cases of suspected protein malnutrition, the patient must be urgently re-referred to the Bariatric Surgery unit.

Anaemia

Whilst iron deficiency anaemia is relatively common following the gastric bypass, it must not be assumed that this is the only cause. Other causes should also be considered and investigated if appropriate. If additional oral iron does not correct the iron deficiency anaemia, parenteral iron or blood transfusions may be necessary. Ensure that the patient maintains levels with oral iron supplements. These should be taken with meals or drinks containing vitamin C to aid absorption and at a different time to calcium supplements. If the anaemia is not due to iron deficiency or blood loss, other nutritional causes should be considered such as folate, vitamin B12, zinc, copper, and selenium deficiencies.

Folic acid and vitamin B12

Low folate levels may be an indication of non-adherence with multivitamin and mineral supplements. However, it could also be an indication of severe malabsorption especially if there are other nutritional deficiencies. Megaloblastic anaemia is caused by folate deficiency or vitamin B12 deficiency. Vitamin B12 deficiency, if untreated, results in irreversible peripheral neuropathy. Therefore, it is essential that vitamin B12 deficiency is considered before recommending additional folic acid. Those patients who are vitamin B12 deficient should have levels corrected with intramuscular injections of vitamin B12. Once corrected, injections of 1mg vitamin B12 every 3 months will maintain levels.

Calcium, vitamin D and parathyroid hormone levels

Vitamin D deficiency may result in secondary hyperparathyroidism to maintain calcium levels.

Steatorrhoea

Patients who have had BPD/DS or long-limbed gastric bypass (>150cm) are at the greatest risk of fat malabsorption and steatorrhoea (presence of excess fat in faeces). This may lead to issues absorbing fat soluble vitamins A, E, and K, as well as protein malnutrition. Patients who have undergone a complex and severe malabsorptive surgical procedure such as BPD/DS, should take extra fat-soluble vitamins. Guidance for appropriate formulations and for managing steattorrhoea should be sought from the patients Bariatric Surgery unit.

Despite additional supplementation, vitamin A levels may drop over time. Changes in night vision may be an indication of vitamin A deficiency. If the patient has vitamin A deficiency, oral supplementation with vitamin A is needed. Vitamin E and K should be checked at least

annually for patients who have had BPD/DS, and other procedures that cause severe malabsorption.

Trace minerals: zinc, copper, and selenium

Unexplained anaemia, poor wound healing, hair loss, neutropenia, peripheral neuropathy or cardiomyopathy may be symptoms of zinc, copper or selenium deficiency. Levels should be checked routinely for SG, RYGB, and BPD/DS and if there is clinical suspicion of deficiency, non-adherence with multivitamin and mineral supplements or a healthy diet in those with LAGB as per table 3. Zinc and copper share a common pathway so supplementation with zinc can induce copper deficiency and vice versa. Information about any additional over the counter (OTC) supplements the patient may be taking is essential. If additional zinc supplementation is required, a ratio of 1 mg copper for every 8 to 15 mg zinc must be maintained.

Thiamine

Although routine monitoring of thiamine is not recommended, the possibility of deficiency should be seriously considered if there is rapid weight loss, poor dietary intake, vomiting, alcohol abuse, oedema or symptoms of neuropathy. All clinicians involved in the aftercare of bariatric surgery patients should be aware of the potential risk for severe thiamine deficiency / Wernicke encephalopathy and commence treatment for thiamine deficiency immediately, this may require admission for administration of IV thiamine.

When to request specialist biochemical / nutritional advice or to refer your patient

Diagnosis and management of micronutrient deficiencies can be complex and so **it is recommended that specialist advice from the patient's original bariatric centre is sought**. The following are **some** examples of when advice should be sought (not an exhaustive list):

1) Newly identified biochemical deficiency, where there is differential diagnosis (there can be causes other than previous bariatric surgery) or its appropriate investigation and treatment are uncertain.
2) Unexplained symptoms that may be indicative of underlying micronutrient / trace element deficiencies.
3) Women who have undergone previous bariatric procedures who are planning to become pregnant or who are pregnant.

Please see BOMSS traffic light poster for the management of Bariatric post-surgical complications in primary care for more information (5).

Privately funded bariatric surgery (6)

Some people may fund their bariatric surgery privately, either in the UK or abroad. There are a variety of reasons for this, e.g., long NHS waiting lists, lack of service availability, or not meeting NHS bariatric surgery criteria.

Patients should be advised of the risks of this, particularly when receiving treatment abroad. **It is up to the patient to have agreed pre- and post-operative care with their chosen provider. Note: Not all private bariatric centres offer a complete service, and this often causes difficulties with provision of follow-up care.** Extra caution should be taken with patients who have had surgery abroad as procedures may not be aligned with those

performed in the UK (3). See Joint statement on surgical tourism from BOMSS and the British Association of Aesthetic Plastic Surgeons (BAAPS) (7), and the following resource which can be given to patients N&W patient information Planning for privately funded bariatric (weight loss) surgery in the UK or abroad.

When choosing a private provider people need to consider if they provide:

- Psychological assessment and support before and after surgery
- Pre surgery care:
    - Complete nutritional assessment with specialist dietitian.
    - Blood tests for nutrition deficiencies, diabetes, cholesterol level and kidney function (routine blood tests not related to bariatric surgery will still be provided by the NHS).
    - Identification of nutrition deficiencies which may need to be treated before surgery.
    - Any multivitamin and mineral supplement required should be purchased OTC.
- Post surgery care:
    - Lifelong follow up is required to ensure that nutrition needs are met.
    - Follow up care including monitoring of nutritional needs is the responsibility of the chosen bariatric centre for at least two years after surgery.
    - After the first two years follow up period, further follow up of nutrition needs is still important and should be assessed at least once a year and should be supported by a bariatric or specialist weight management centre.
    - This may be provided by the GP if they have agreed to do this with the bariatric centre under a shared care model.
    - If the surgery causes malabsorption (e.g. BPD/DS or long limb gastric bypass), the bariatric centre should provide follow up care for life.
    - A complete multivitamin and mineral supplement should be taken every day and should be purchased OTC- see table 5.
    - For the procedures where additional iron tablets, and vitamin B12 injections are required, then these can be prescribed by the GP practice (see table 4).
    - Higher serum levels of vitamin D are often recommended in post bariatric surgery patients, loading doses of high potency vitamin D, or ongoing maintenance doses may be requested by the bariatric surgery centre. These can be prescribed by the GP. See table 6 for appropriate formulations and ICB guidance on managing Vitamin D deficiency in primary care.
- Guidance on where to signpost if issues following private bariatric surgery:
    - In the first 2 years the bariatric centre where the surgery was performed should investigate any issues or concerns.
    - The NHS provides follow up care for anyone requiring immediately necessary clinical care (acute complications), e.g., admission under local surgical team or send to A&E as clinically appropriate.
    - Ensure patient brings along any relevant paperwork which was provided about their surgery. This should also be available for the patients registered GP practice after discharge from their Bariatric Surgery unit.

Vitamin and Mineral Supplementation

NHS Norfolk and Waveney (N&W) does not commission Maintenance or Preventative vitamin and mineral supplementation. N&W Self Care Policy has been developed to reflect the NHSE guidance: Conditions for which over the counter items should not be routinely prescribed in primary care (March 2024) (8, 9).

- Patients requiring maintenance or preventative vitamin and mineral supplementation should be advised to purchase an OTC preparation, this includes post bariatric surgery (see tables 5 and 6).
- **Note: if a prescriber has concerns that a patient might not be able to or is unwilling to self-care and treatment with a medication is required, then a prescription (FP10) should be considered (Forceval: one daily).**
- NHS N&W does commission vitamin and mineral supplementation (in line with local formulary) for Treatment of Medically diagnosed deficiency e.g., Vitamin D (treatment or loading doses only).

Table 4: Vitamin and mineral supplementation recommendations

Recommendation	**Laparoscopic Adjustable Gastric band**	**Sleeve gastrectomy**	**Roux en Y Gastric bypass**	**Biliopancreatic diversion / Duodenal switch**
Impact on absorption	No impact on absorption	May be some impact on absorption including iron, zinc, selenium, and vitamin B12	Impacts on absorption of iron, zinc, copper, selenium, vitamin B12, folic acid, calcium and vitamin D. Long limb bypasses may affect absorption of protein, fat, vitamin A and trace elements in addition	Impacts on absorption of protein, fat, calcium, Vitamin B12, folic acid, fat soluble vitamins A, D, E and K, zinc, copper, and selenium
Multivitamin and mineral supplements See table 5 below for suitable options	OTC Complete 100% A-Z multivitamin and mineral supplement **TWO daily in order to achieve the minimum copper requirement (exception: Forceval which should be taken once daily)** Multivitamin and mineral supplement should include (3): • Iron • Selenium • 2 mg copper (minimum) • 15 mg zinc (ratio of 8 to 15 mg zinc for each 1 mg copper) • 400-800 micrograms folic acid			

Thiamine	Sufficient contained within multivitamin and mineral supplement. If patient experiences prolonged vomiting always prescribe additional thiamine and urgent referral to bariatric centre. Those patients who are symptomatic or where there is clinical suspicion of acute deficiency should be admitted immediately for administration of IV thiamine.	
Calcium and Vitamin D	Not routinely required for LAGB	Continue with maintenance doses if required as directed by the patients' bariatric surgery unit. Recommended additional supplementation of 800-1200mg Calcium per day and 800IU (International Units) or 20mcg (micrograms) of Vitamin D per day in addition to an OTC A-Z multivitamin and mineral supplement (which should also contain calcium and vitamin D) is advised. See table 6 for suitable maintenance formulations. Prescribe in line with N&W formulary. Ensure good oral intake of calcium and vitamin D rich foods.Treat and adjust vitamin D supplementation using oral preparations to meet serum levels recommended by bariatric specialists. This may be higher than levels recommended for the general population. On occasion prescription of high potency colecalciferol, including vitamin D injections (rarely) may be requested by the specialists. Requests for high potency treatments outside of N&W formulary should be discussed with the ICB prior to prescribing. Once recommended serum levels are achieved then maintenance vitamin D supplements should continue to be prescribed (see table 6).
Iron	Continue with maintenance doses if requested by bariatric surgery unit (prescribed by GP)	**Men / non-menstruating women AND menstruating women:** 200 mg ferrous sulphate **one daily**, 210 mg ferrous fumarate **one daily** or 300 mg ferrous gluconate **TWO daily** (prescribed by GP*) Notes: • Advise people to take iron supplements with citrus fruits/drinks or Vitamin C. Advise people to take calcium and iron supplements two hours apart as one may inhibit absorption of the other. • Iron supplementation should be assessed in line with blood test results and additional supplementation may be required (4).
Vitamin B12	Not routinely required for LAGB	Lifelong IM Vitamin B12 replacement can be offered **but** oral replacement can also be considered: • Oral: 1mg/d (1000mcg) (**OTC only**- see N&W ICB Vitamin B12 guidance for options). • Intramuscular injections: 1mg Hydroxocobalamin every 3 months

Folic Acid		Encourage consumption of folate rich foods. If deficiency suspected e.g., megaloblastic anaemia, check adherence with multivitamin and mineral supplement. Check for vitamin B12 deficiency before recommending additional folic acid supplements as per N&W ICB Vitamin B12 guidance. Recheck folate levels after 4 months	
Fat soluble vitamins A, E and K		Sufficient contained within vitamin and mineral supplement. Additional fat-soluble vitamins may be needed if patient has steatorrhoea- please seek guidance from the patient's Bariatric Surgery unit	Additional fat-soluble vitamins (A, E and K) may be required in some cases as advised by the Bariatric Surgery unit. Please seek advice from ICB Dietetic team for appropriate formulations if requested.
Zinc and copper		Sufficient contained within multivitamin and mineral supplement. If additional zinc is needed, ratio of 8 to 15 mg zinc per 1 mg copper must be maintained. Please seek advice from the patient's Bariatric Surgery unit for advice on timescale, dose, and monitoring	
Selenium		Sufficient selenium is contained within multivitamin and mineral supplement. If required, additional selenium may be provided by two to three Brazil nuts a day. Please seek advice from the patient's Bariatric Surgery unit for advice on timescale, dose, and monitoring	

Table 5: Suitable over-the-counter A-Z multivitamin and mineral supplements. Formulations checked for suitability and price Jan 2026 (for update every 6 months). **Please note: these supplements are not suitable in pregnancy- please ensure specialist advice is sought if the patient is pregnant or planning to become pregnant after bariatric surgery.**

Surgical procedure	Suitable OTC preparations	Price per 28 days (based on best value pack size)
LAGB, SG, RYGB, BPD/DS	**Take ONE daily:**	
	• Forceval Capsules	£13.52
	Take TWO daily:	
	• Asda A-Z Multivitamin & Minerals Tablets	£2.91
	• Boots A-Z Multivitamin and Minerals Food Supplement	£1.74
	• Holland & Barrett - ABC-Z Multivitamins	£1.57
	• Morrison's A-Z Multivitamins & Minerals	£3.02
	• Numark/Rowlands A-Z Multivitamins & Minerals	£3.70
	• Sainsbury's A-Z Multivitamins & Minerals	£3.08
	• Sanatogen Complete A-Z	£10.04
	• Superdrug A-Z Multivitamin + Minerals	£2.17
	• Tesco A-Z Multivitamins and Minerals	£3.08
	• MyVitamins A-Z Multivitamin Capsules	£3.08

Table 6: Suitable Calcium and Vitamin D supplements (suitability checked Jan 2026). See N&W Netformulary
Please note: Calcium supplements should be taken at least 2 hours apart from any vitamin and mineral supplements containing iron as one may inhibit the absorption of the other.

Surgical procedure	Suitable preparations for prescription
SG, RYGB, BPD/DS	**Take ONE daily:** Calci-D chewable tablets (1000mg Calcium + 1000IU Vitamin D) Thei-cal D3 (1000mg Calcium + 880IU Vit D) **Take TWO daily:** Accrete D3 Film coated tablets (2 tablets provides 1200mg Calcium + 800IU Vit D) Adcal D3 Dissolve effervescent tablets (2 tablets provides 1200mg Calcium + 800IU Vit D)

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